Source Book of Biological Terms

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Frontispicium

One of the disciplines of the study of Biology is the acquirement of a technical vocabulary. Medical schools stress the importance of this phase of undergraduate courses as a preparation for the multitude of professional terms necessary to the training of physicians and surgeons. Every student expecting to teach should learn standardized pronunciations and meanings, because in later life his influence spreads by geometrical progression through many generations of pupils. Each term incorrectly used becomes responsible for an ever widening circle of faulty repetition.

The language of Biology seems strange to beginning students because most of the terms are of Greek or Latin extraction, a custom transmitted from the Middle Ages when the classical languages furnished the only means of communication among the professions. To many students the memorizing of new expressions by rote detracts interest from the subject. But when seemingly foreign words are given a meaning by being translated and when an historical insight is afforded as to why the biologist coined and applied the term the learning of a technical vocabulary takes on a certain satisfaction as the student realizes that nomenclature is a help and not a hindrance to his studies.

Six years ago four thousand copies of a preliminary list of biological terms were printed by photo-offset process from varityped copy for distribution to students in the Department of Biology at the City College of New York. This booklet of thirty-two pages, bearing the title *The Source of Biological Terms,* is now out of print. Its usefulness and the constant demand for further copies inspired the elaboration of the present work. The restriction limiting distribution to students of the City College of New York has been withdrawn, and the book is now made available to biology students anywhere. The first printing in November, 1937, has now been completely distributed, thus calling for this second edition.

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PART I.

I. Biological Nomenclature

The system of binomial nomenclature instituted by Linnæus about the middle of the eighteenth century holds that for exact reference, every distinct kind of animal and plant is to have a genus name and a species name, and that these are to be descriptive terms written completely in Latin form. The biologist who first describes and names any species has the privilege of selecting any appellation not previously used in science. Where the ancients had a name for a species that term has usually been resurrected, but applied as a generic name in present-day taxonomy. Thus, many familiar animals and plants still bear the names in use during Roman times, such as Equus, horse; Gallus, chicken; Canis, dog; Avena, oats; Quercus, oak; Rosa, rose.

In the modern system of classification there are several kinds of horses or dogs, and many kinds of roses and oaks. The generic name requires specific limitation, so the ordinary horse is technically *Equus caballus,* the species name here being the old Latin word for a workhorse; the ass is *Equus asinus,* using the Latin name for the ass; the zebra is *Equus zebra.* When the Latin names have been depleted, then Greek names are often used for closely related forms. Thus the wild ass of Central Asia is *Equus onager,* taking the Greek name ὄναγρος, *onagros,* for this animal but using it in Latin form. Because more species of animals and plants are known now than in ancient times it has become necessary to extend the system of nomenclature in various ways when

selecting names for species. For instance, the species of Equus known as *E. burchelli, E. granti* and *E. grevyi* are closely related to *Equus zebra* and are translated as Burchell's, Grant's and Grevy's zebras, the names having been bestowed in honor of three naturalist explorers. The names of extinct ancestral horses are based on the Greek word for horse, ἵππος, *hippos,* as in the genera Eohippus, Mesohippus, Hypohippus, Pliohippus, etc. In those cases where there were no classical equivalents, new names have been coined as Neo-Latin nouns and adjectives, even when based on Greek or other derivation. To illustrate by citing a species well known to college students: *Drosophila melanogaster,* the laboratory fly so widely used in genetics breeding experiments, is small and inconspicuous, and even though it may have been abundant two or three thousand years ago the Greeks had no special name for it. The literal translation of its newly coined Latinized Greek name is "a dew-loving black-bellied fly," not a particularly appropriate description, but serving the purpose to differentiate this from a hundred other species of Drosophila and to identify this group of species among a hundred other genera of related flies.

The common or vernacular names of the more familiar species of plants and animals are usually of Anglo-Saxon derivation. For the most part they are monosyllabic words that are regarded as non-technical and are easily understood. A dictionary is rarely needed for such terms as ant, bee, bird, fish, horse, or for the names of appendages and bodily parts, such as neck, brain, knee, arm, leaf, seed, etc.

Descriptive terms used in morphology, physiology, embryology, etc., are usually in English form, although most of them are compound terms of classical ancestry. Such adjectives as basic, binomial, elongate, extrinsic, homonomous, meroblastic, etc., illustrate this phase of biological vocabulary, words that have been acquired from the languages of the Greeks and Romans though with modernized meanings. Occasionally some biological expressions have come from other sources, such as mushroom, parrot, palisade and tissue from the French; amber, nucha, sesame, Berberis, Ribes and sugar from the Arabic; alkali from Egyptian; leg

and skull from Icelandic; gill from old Danish; tea from Chinese; dodo and albatross from Portuguese; kangaroo from Australian natives; jaguar and puma from South American Indians; and moose and wapiti from North American Indians.

Actually, although the number of polysyllabic technical words used in Biology seems large, their comprehension should not be appalling, because they are formed as recombinations of relatively few stems. Even the longest words are a shorthand description which when translated into usual language may result in an expression less concise than the original term itself. The word Cyclostomata signifies a division of the animal kingdom characterized by having a round mouth. To use the word Spermatophyta is the equivalent of designating a phylum of plants distinguished from all others by the production of seeds.

Strongylocentrotus drœbachiensis (O. F. Müller) is the name of the commonest sea-urchin of the northern coasts. A free translation of this unusually formidable name states that this creature is abundantly studded with spines by means of which it turns round and round, that it was first collected at Dröbak (a seaport suburb of Oslo, Norway), and that it was originally described by Otto Friedrich Müller (a Danish zoologist who lived 1730-1784). The parenthesis for Müller's name indicates that the species was first placed in Linnæus' genus Echinus, but was removed (by Alexander [not Louis] Agassiz) to the subsequently erected genus Strongylocentrotus.

When the meaning of *meta* is understood, implying beyond, after, or next after, it helps to clarify the frequent recurrence of this prefix in such commonly used words as metab'olism,* metacar'pal, metagen'esis, metamorpho'sis,

* The most important phase in the pronunciation of technical words is the proper placing of the accent. The system adopted throughout the book is to indicate the syllable bearing the primary accent by placing an acute accent mark after its vowel. If the vowel carries any of the customary longer English sounds the accent mark immediately follows, leaving the syllable open. When the vowel is shorter the accented syllable is closed by a consonant. This is merely a convention adopted for the convenience of the reader, even though in some cases the assignment of the consonant to the preceding vowel is not in conformity with traditional syllabification.

met'aphase, met'aplasm, metatar'sus, Metathe'ria, metatho'rax and Metazo'a. Another illustration is the Greek word *soma* (σῶμα, stem σωματ-), meaning body, which appears in the expressions au'tosome, cen'trosome, chro'mosome, proso'ma, somat'ic, somatogen'esis, so'matopleure and so'mite. This is not to be confused with the Greek word *stoma* (στόμα, stem στοματ-), meaning mouth, on which are based such terms as Branchios'toma, Cyclostom'ata, Dis'tomum, neph'rostome, peristo'mial, physos'tomous, prosto'mium, stom'ata, stomodæ'um and Stomox'ys.

II. The Romance of Taxonomic Names

It is commonly the custom to construct the names of genera from Greek components and those of species from Latin. The names of higher ranks are derived from "type" genera, at least family names are, while Orders, Classes and Phyla are for the most part independent words of Greek derivation. Technical descriptive terms are also of foreign extraction, so it becomes interesting to look into the mind of the nomenclator and uncover his reason for making his selection. The sunflower daily twists to keep facing the sun. This floral habit is so characteristic that the French popular name for the plant is *tournesol* or sun turner, the Italian name is *eliotropio* meaning exactly the same, and the German name is *Sonnenblume,* which we translate to sunflower. When the botanist was called on to create a generic name for this plant he decided on Helianthus (ἥλιος, *hēlios,* sun + ἄνθος, *anthos,* flower).

To name a white butterfly Ascia is a poetic way of regarding it, since the name translated means "without a shadow." This word is suggestive of the term Ascians, or inhabitants of the tropics, who were so called by the ancients because they cast no shadow at noon. In contrast to the

Ascians the inhabitants of the polar countries were called Macroscians, or long shadows. The Greek word for shadow, *σκιά, skia,* appears again in the word squirrel, which literally means shadow tail (*σκίουρος, skiouros,* > Latin *sciurus*). From the French version *écureuil* the name squirrel emerged.

The book-louse, a tiny creature that eats its way into old volumes, is named *Troctes divinatorius,* literally "an instinctive epicure." Acarus, the mite, translates into "too small to be cut," reminding us of the term atom, "not cut," a characterisation no longer true for the much used chemical term. Geometer, the looping caterpillar, measures the earth, an inch at a time. The skunk is named *Mephitis mephitica,* doubly imprecated as a "pestilential exhalation." The word Myriapoda means "ten thousand legs." Even the common designation "thousand-legged worms" is an exaggeration. Milfoil, derived from the Latin *millefolium,* means a thousand leaves, though the plant does not have nearly that number. The saxifrage is an unobtrusive little plant that seeks a precarious foothold on bare rocks, in disregard of its name "the rock breaker." Scientists are expected to be exact, but in the realm of nomenclature great leeway is permitted, and the biologist who speaks in hyperbole, writes figuratively and indulges in poetic imagination enlivens his terms so they stand forth in the maze of prosaic reality.

The generic names of plants and animals teem with classical allusions. Arachne, the spider, was a Lydian maiden who almost won a spinning match from Minerva and was changed into a spider for her presumption. The paper nautilus was described by Aristotle as navigating the surface of the sea by using its arms as oars and raising its membrane as a sail. Linnæus bestowed on it the technical name *Argonauta Argo,* having in mind the Argonauts who were the sailors of Jason's ship, the Argo. The word nautilus, as well as nauplius elsewhere used in Zoology, means a sailor in general.

Unio, the fresh-water clam, derives its name from the old Roman use of this term for a single large pearl. The cestus, Venus' love-girdle, shifted to an internal position when the term was applied to the Cestoid tapeworms. Hydra, the

small laboratory animal, was named from the mythical Hydra, a seven-headed water serpent finally slain by Hercules. Beheaded Medusa of Grecian mythology, whose tresses were snakes, lives today in countless repetition in the oceans as tentacled little jelly-fishes. Gordius, the horsehair worm, entangles itself in a snarl suggestive of the fabled Gordian knot.

The common quahog or hard shell clam of the Atlantic coast was named *Venus mercenaria* by Linnæus. In selecting the genus name Linnæus possibly had in mind the tradition about Venus arising from the sea, though it is claimed he was more impressed by the suggestive venerean appearance of the hinge parts; but students question the propriety of calling this common laboratory mollusc the mercenary Venus. In the time of Linnæus this clam furnished most of the material from which were cut the wampum beads used by the Indians for currency, hence the application of the name.

Among the plants there are many instances of names inspired by personages of mythology. Iris, the flower, was personified by Ἶρις, the Rainbow. Hyacinth, the flower, arose from the blood of Hyacinthus when he was accidentally killed by a discus thrown by his dearest friend, Apollo. Cyparissus, another friend of Apollo, had the misfortune to shoot his pet stag. Worry over this accident transformed the youth into a cypress tree, the symbol of beloved dead, still often planted in graveyards as a token of mourning. The white water-lily, Nymphæa, was the flower dedicated by the Greeks to the Water Nymphs, while one of them, Lotis, was singled for special commemoration through the lotus flower. When Narcissus died, narcissus, the flower, sprang from his grave. The reputed medicinal properties of the plant originated the term narcotic (ναρκάω, *narkaō*, grow numb). Another such transformation is recorded in the name mint applied to the plant into which the Nymph Μίνθη, *Minthē*, was changed by Proserpine. The date palm, which thrives in the desert, is generically named Phœnix, in allusion to the mythical Egyptian bird that periodically burned itself and arose with renewed youth from the ashes.

III. Classical Sources for Names

Some biologists, in originating technical terms, have imaginatively extended words formerly in classical use, but long since defunct, to meet their needs. Such esoteric selections arouse interest among the initiated, as may be illustrated by the following citations. An ambulacrum used to be a Roman walk shaded by rows of trees, or a garden path bordered by flowers; biologically it is the groove along the adoral side of starfishes containing the series of extensile tube-feet. Nectar, the sweet secretion of flowers, much sought by bees, originally referred to the wine-like drink of the Grecian gods. Omphalus, the navel, was the term given to the temple at Delphi because it was considered to be the central place of the flat earth. Aspergillus, a form of bread mold, originally meant a brush for sprinkling holy water, which implement it microscopically resembles. Xenia is a term used for the effect on certain plants when fertilization results from pollen from a different race; originally it meant the hospitable privileges accorded an overnight guest. A dinner guest was formerly called a parasite, with no derogatory intention (παράσιτος, *parasītos,* eating with another, derived from παρά, *para,* beside, and σῖτος, *sitos,* food). Other messmates are indicated by the words commensal (*cum,* together, *mensa,* table) and companion (*cum* + *panis,* bread, *i.e.* "breaking bread together").

A vestige is literally a footstep, clearly a different meaning from rudiment, the first trial in anything. Philtrum to the ancients was a love-charm; to the zoologist it is the central part of the upper lip, which undoubtedly has often performed that function. When in the process of growth an insect or a crustacean molts its shell it is said to undergo an ecdysis; literally it is taking off its shirt. The vocal organ of birds, called the syrinx, derives its name from Syrinx, a nymph in Grecian mythology. Pursued by Pan (the word panic

comes from the fright he caused) she begged to be changed into a group of reeds, from which Pan then cut his musical pipes. A torus was a marriage bed in Roman times; botanists use the term for the receptacle of a flower, the part supporting the stamens and pistils. Hermaphroditus, the mythical son of Hermes and Aphrodite, was united bodily with the nymph of the fountain where he bathed. The resulting bisexual condition suggested the application of his name to the zoological phenomenon of maleness and femaleness combined in a single individual. The word orange means golden, a term in itself expressively beautiful, but when the botanist calls an orange, regarded as a particular kind of fruit, an hesperidum, one is minded of the Hesperides, daughters of Evening, who guarded the orchard of golden fruit beyond the Western horizon.

Scientists are popularly regarded as matter-of-fact, prosaic individuals, narrow-minded because of their concentrated interest on a particular field. The citations of this book show that technical nomenclature instead of being an uninteresting though inevitable adjunct of Biology, has been developed by an imaginative, well-read group of scholars.

IV. Evolution of Word Meanings

In the evolutionary changes affecting languages many words are now used with meaning greatly altered from that of centuries ago. For example, a skeleton implied to the ancient Greeks a dried mummified carcass, and the term anatomy once signified the bones after the flesh was removed. Corpse (Latin *corpus*) first meant the body, dead or alive. The stomach (derived from Gr. στόμα, *stoma,* mouth) originally referred to the œsophagus because it is next to the mouth. A stamen was one of the strong warp strings in an ancient erect loom; the plural form stamina has become converted into a singular noun meaning ability to endure

strain. Intoxication is not suggestive of archery, but the word has descended from the Greek τόξα, *toxa,* bows and arrows, by way of τοξικόν, *toxicon,* arrow poison, and then the Latin *toxicum,* any poison. Climate (from Gr. κλίμα, *klima,* inclination) referred to the slope of a tract of ground before the word was used for the meteorological conditions affected by such inclination.

Immunity once designated the exemptions granted to Roman public officials. A vestibule was the entrance to a stable, which in turn is literally a place where animals stand, usually in stalls (A.S. *steal,* from the same root as the Latin *sto,* stand) ; hence a stallion is a stall-horse to distinguish him from a common work-horse. An organism is an organization of organs, each literally an instrument performing a special part. The Latin *manus,* hand + *opera,* work, became *manœuvre* in French, which, entering the English language, divided in meaning to imply either the dignity of skilful management or the humility of hand cultivation of crops, in the latter sense degrading to the term manure.

To illustrate how a word may emerge with a wholly altered meaning as its evolution has been influenced by metonomy, the genealogy of the word person may be traced. The Latin verb *persŏno,* (to) sound through, gave rise to the noun *persōna,* a mask worn by actors. This facial covering gained its name because of the large round mouth-opening through which the actors spoke, and it has even been suggested that the long "o" of *persōna* was due to the resonance of the sounds coming through the mask. The successive meanings of the word person have shifted from the mask (A) to the actor when wearing the mask (A + B) ; then to the actor alone (B) ; then to the character depicted by the actor (B + C) ; then to personality in general (C) ; then personality associated with any human being (C + D) ; and finally the indication of any human being (D).

The word character, used above, has had a parallel devious history. Originally χαρακτήρ, *charaktēr,* was an engraving tool (A), then the marks made by the tool (A + B), then any delineations, such as numbers, letters, or written words (B), then characteristics, qualities, traits and abilities

distinctive of an individual (B + C), then the individual represented as combining such qualities (C), and finally the taxonomic use of the term to indicate the hereditary units possessed in common by related individuals (C + D), or the modifications acquired in the course of ontogeny (C + E).

A supercilious person is arrogantly haughty in the present significance of this word. The name derives from the eyebrows (*supercilia* in Latin), which when arched indicate insolence, but when contracted in a frown (which the Romans described as *superciliosus*) suggest sternness, irritation, or displeasure. The chrysalis of a butterfly fastened to its support by a silken girdle is literally succinct (*succinctus*, girded below). Originally this term meant having the clothes tucked up under a belt, therefore indicating preparedness; the idea survives in the modern use of succinct for concise, compact, and not spreading.

An ordinary Greek civilian as contrasted with a soldier was an ἰδιώτης, *idiotēs*, the term having been derived from ἴδιος, *idios*, meaning personal and private (see idiosyncrasy, page 34). By degrees the meaning changed, becoming progressively a layman as distinct from a professional man, a commonplace fellow, an illiterate person who had not the opportunity of becoming educated, a person illiterate because of mental deficiency, and finally an idiot in the present acceptance of the term.

The word psyche (ψυχή) first meant breath, then through a series of transitions it represented breathing as a sign of life, life, the principle of life, the soul, spirit, understanding, reason and the mind, as the last of which it appears in the term psychology. In the legends of mythology, Psyche, personifying the human soul, was pictured as a maiden with butterfly wings, or sometimes as a butterfly; hence the entomological use of the word for some of the Lepidoptera. The Latin word for breath, *anima,* has had a similar history, passing through the stages signifying wind, air, breath, life, vital principle, soul and reason.

A cynosure is an envied object in the center of attention; literally it is a dog's tail (κυνός-ουρα, *kynos-oura*). The history of this word shows that Cynosure, the constellation which

the Romans called *Ursa Minor*, the little Bear, contains the polar star, by which mariners navigated; hence any object on which attention was concentrated became a cynosure. The Greek word for dog appears again in cynic, descending from κυνικός, *kynikos*, snarling like a dog. The word sarcasm comes from σαρκάζω, *sarkazō*, tearing flesh like a snarling dog. Because the flesh of corpses was consumed by quicklime, λίθος σαρκοφάγος, *lithos sarkophagos*, a coffin made of limestone came to be called a sarcophagus. A cemetery was at first a sleeping room (κοιμητήριον, *koimētērion*). A bed provided with mosquito curtains (κανοπεῖον, *kanopeıon*) against the attacks of gnats (κώνωψ, *kōnōps*) indicates the origin of the word canopy.

A sycophant was originally an informer against the illegal sale of figs (σῦκον, *sykon*, fig, φάντης, *phantēs*, exposer); in time the meaning changed to any tale-bearer, a flatterer, an impostor.

Beelzebub was the first dipterist to achieve renown, his name signifying Prince of Flies (Heb. *baal*, prince + *zebub*, flies). A destroyer of flies, he became deified as a god of healing, which shows an early recognition of the relation of flies to public health; and then because sickness was supposed to be inflicted by demons, he was later identified as a prince of demons, and popularly as the chief demon, or the devil. From an exalted position as a public benefactor Beelzebub has descended the shifting pathway of verbal change to reach the bottom.

Changes in the meanings of words have been as prevalent in early English as in the terms of classic Greek and Latin extractions, as may be illustrated by the following jargon. When at three o'clock some noon, after nunchion, we take a bath in a stove which was heated by a chimney provided with a tunnel, we are not in topsy-turvy land, but merely indulging in some linguistic archeology, to show the shifts in meaning that common words have undergone. A glossary of early English definitions would disclose that noon, literally the ninth hour, formerly was three o'clock. Nunchion was noon drinking, corresponding to afternoon tea. Combined with a lunch, *i.e.* a lump of bread, nunchion became lunch-

eon. Stove was a bathing room before it became the heater for the room. Chimney was the fireplace, predecessor of the modern stove. Tunnel was the name for the flue passing through the roof.

Other commonplace words have shifted in meaning to a surprising extent. The place where the animals of a household (menage) were kept was a menagerie, a word still used in France for a poultry yard. The keeper of domestic animals was a steward, or sty warden. A farmer was called a villain. A butcher is literally a killer of goats. A scavenger was a custom's inspector. A physician was often called a leech (AS. *læce,* the healer) because of the common practise of using leeches in letting blood.

A dissecting kit, such as is used by students of Biology, is called in Frênch an *étui.* In Middle English it was a chirurgien's ettuy, simplified in pronunciation to "twee." A folded or double case was given a plural designation, twees, and any of the instruments in the kit was called a tweeser, a term eventually restricted to the forceps. There has been a general tendency to use the plural formation for those instruments which are made of two matched parts, such as scissors, shears, nippers, pincers, forceps, pliers, tongs and tweezers.

The etymology of the word scissors dates back to the Latin *scissor,* a person who cuts, or a carver, derived from the verb *seco,* cut, and akin to the Greek σχίζω, *schizō,* rend asunder. In French the word lost its personality, becoming *ciseau,* a cutting tool, and in plural form *ciseaux* meaning small shears. When introduced into English the Latin spelling was resumed but applied to the French impersonal meaning. Strictly speaking, a pair of scissors should mean two persons who cut.

Scalpel is the Latin *scalpellum,* little knife, from the verb *scalpo,* cut. In Middle English it was called a scalping iron, *i.e.* a cutting iron, wholly without relationship to the hair and skin of the top of the head that might have been removed by its use. Forceps literally means an instrument for taking hold of something hot, *i.e.* a tongs.

V. Word Homologies

Unexpected homologies are disclosed when tracing the history of certain words. For example, bowels and botulinus are both derived from the same source, an old Latin term for sausage, the bowels becoming the casing for the sausage and the botulinus a bacterium growing on spoiled sausage. Both lampreys and limpets are rock suckers. An ancestor is literally one who has gone before (past tense); an antecedent is one going before (present tense). Cattle, *i.e.* the number of heads (*capita*) of cattle, early represented wealth, or "capital"; hence chattel, another form of the word. Spiders are spinners, both terms meaning the same. A mutation and a molting both originated from a word meaning change. Adult, alumnus and alimentation all trace to the Latin *alo,* nourish. Sputum and pituitary are derived from a term for secretion, and from the same remote source have come spew, puke, pip, pitch and pine. A museum used to be a temple of the Muses who presided over science and art; a mosaic is but a short verbal change from *musæum opus* for the small objects displayed within a museum. Species and spices are historically the same, formerly being interchangeably used to mean kinds of things. *Pupa,* a doll, and *pupilla,* the small image of a person reflected from the center of the eye, have found divergent application in the pupal stage of insects, the pupil of the eye, pupils as youthful students, as well as the cognates puppet and puppy. The lobe that protects the entrance to the human ear is called the tragus, which is Greek for goat. The application is no more involved than to say a tragedy is a goat song (τραγῳδία, *tragoidia,* tragedy, from τράγος, *tragos,* goat + ᾠδή, *oidē,* song). The ear prominence often becomes hairy, suggesting a goat's beard; tragedies were first sung by actors dressed in goat-skins to represent satyrs.

Another interesting illustration of the devious ways by

which words have entered our language begins with the Greek word κόραξ, *korax*, meaning a crow. As coracoid, originally the curvature of a crow's beak, it is used biologically for the coracoid process of the shoulder girdle; then as κορώνη, *korōnē*, it indicated anything curved, like a ship's prow, a doorhandle, or the hooked end of a bow. Adapted into Latin as the word *corona* it implied the complete curvature of a wreath, and finally the top of the head on which a wreath may be placed. From the same source have been derived corolla (diminutive of corona) meaning a small garland, corollary, originally the gift to an actor of a garland of artificial flowers, coronary suture of the liver because it encircles and coronary suture of the skull because of its location at the front of the crown, as well as the cognate words curve, curb, cornice, coronation and coroner (originally crowner).

VI. Word Phylogeny

Biologists visualize the course of evolution by constructing phyletic trees. Evolution, meaning descent with modification, applies to the development of languages just as much as to other biological phenomena, so it is possible to use this illustrative device to show the transitions that words have undergone while human tribes have spread over the world.

The recorded Indo-European group of languages dates back to Sanskrit, some 3500 years ago. While 3500 years is a long time to the philologist, the biologist is aware that articulate man inhabited Europe many tens of thousands of years before he invented writing. Eolithic man gave way to Palæolithic races who later were displaced by Neolithic invaders, still before the dawn of history. Nomadic tribes, bringing language if nothing else, isolated themselves here and there and developed their own tongues. Early man was

distrustful of strangers and did not mingle with other groups in barter or intermarriage. His clannishness resulted in the development of dialects, just as his limitations in mating tended to fix tribal biological characteristics. The influence of the parental source for words, however, shows through the various dialects, so the anthropologist derives much evidence for the kinship of man from the interlocking of languages.
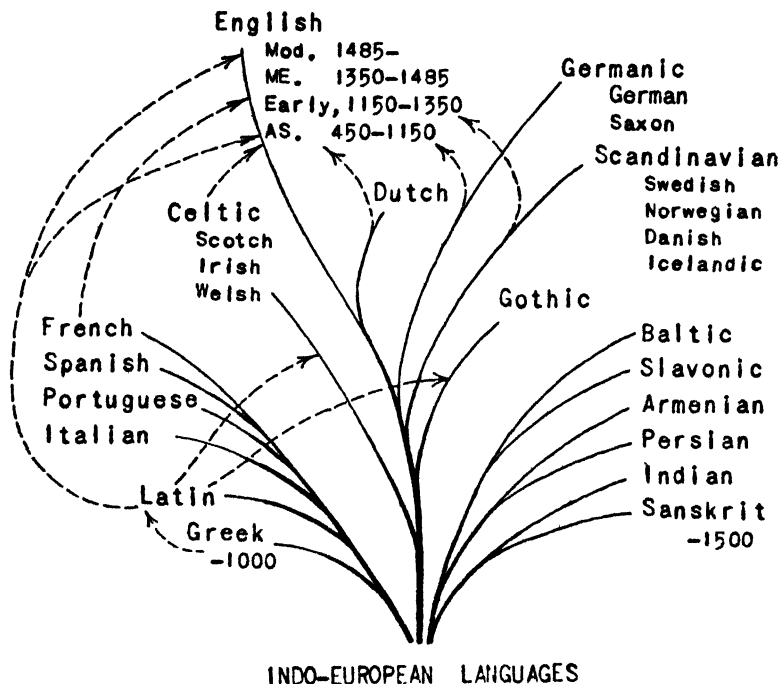
CHART I. The Complex that is the English Language. The solid lines indicate direct lineage; the dotted lines show the nativity of immigrant terms.

The accompanying chart shows that present-day English is a polyphyletic language. Deriving its basic vocabulary from the Teutonic branch of the Indo-European family the English language is filled with foreign additions, some picked up in the original migration from Central Asia, but most thrust into the language as words already specialized by other branches of the European race.

The early Britons who inhabited England before the Roman conquest (A.D. 50-300) contributed little that has remained in English of today. Following the withdrawal of the Romans, groups of Angles, Saxons, Jutes, Danes and Norsemen came from the continent to settle or to invade, and their closely similar expressions became welded together to form the basis of the simple and limited vocabulary characteristic of early English. This language was enriched by the Norman influence during the eleventh to fourteenth centuries. Later by deliberate effort following the Middle Ages, because of the fashion to show erudition by drawing on the classics, many Greek and Latin expressions were introduced directly or with slight modifications, to find their place in learned writings. It is because of this influence, which is still maintained by scientific writers and others who find the need to create new terms, that living Biology is subservient to dead Latin.

To illustrate the transitions in meaning that words undergo as they pass from one group of people to another to appear again and again in our language, the following chart is presented. Comparative philologists know many consistent changes in vowels and consonants that characterize the migrations and settlings of ancient man. That PLU in South Europe should become FLO in the North was as regular as the distribution of brunettes and blondes.

VII. The Origin of Words

Among the parallelisms between the evolution of organisms and the development of language there are the unsolved problems of the beginning. Biologists speculate about the abiogenetic origin of life, a new state of being emerging from a hitherto lifeless world; philologists have devised many theories to account for the first intelligible human utterances.

CHART II. The Genealogy of the FLY Family; an Illustration of the Metamorphosis of Words.

The advent of articulate, reasoning man is placed at a million years before the dawn of history. During this remote period what the initial stages were in formulating a primitive language can never be determined. The several theories that

have been advanced have been subject to ridicule, as evidenced by the sarcastic nicknames applied to the following:

1. The pooh-pooh theory places the origin of language in involuntary exclamations and interjections.

2. The bow-wow theory holds that language began in the imitation of natural sounds.

3. The ding-dong theory claims that primitive man responded to his sense impressions by reflex utterances, analogous to the sound emitted by a bell when struck by the clapper.

4. The goo-goo theory holds that no matter what stimulated the first expressions, languages resulted only from a trial and error process of repetitious use.

Of biological interest is the bow-wow theory. Certainly many insects, birds and animals are known because of the sounds they produce. Katydid, cricket, cicada, tettix, bumblebee, drone and clickbeetle are imitative names of insects. Bob-white, chickadee, cuckoo, whippoorwill, phoebe, towhee and peewee are well-known birds readily identifiable by their call. The Greek word ὗς, *hus,* pig, undoubtedly represented a grunt before it became transformed into the Latin *sus* and the English sow. Of verbs, grunt, roar, buzz, croak, squeak, snarl, caw, mew and purr have had an onomatopœic origin.

It took only a few thousand years for the Greek βοῦς, *bous,* to branch into Latin *bos, boves,* French *boeuf,* English *buffalo* and *beef,* Gaelic *bo,* Swedish *ko,* German *kuh,* Anglo-Saxon *cu* and English *cow.* What happened during the hundreds of thousands of years before the Greeks wrote the word βοῦς, or its stem βου-, can never be recalled. Perhaps the childish terms moo-cow and bossy-cow are reminders of the childhood of man.

Of course, not all animals and none of the plants are sound makers, and so the names of the silent species could not come under the imitative rule. Whether such terms as spine, sting, Latin *spina,* Greek ἄκρος, *akros,* or Latin *urtica,* represented interjections is anyone's guess. *Urtica* (sting > nettle) may represent the same reflex that prompted a Briton to coin the word "hurt."

The Language of Flowers has a varied meaning. In a

sentimental sense many flowers symbolize ideas: rosemary for remembrance, rue for sorrow, lily for purity, forget-me-not for constancy, pansy for pleasant thoughts, etc. There are also distinctive State flowers, as well as political emblems, such as the recent exploitation of the sunflower. In their common names many plants carry an expressive interpretation of their characteristics. It compels interest to regard a possible bouquet of Jack-in-the-pulpit, spring beauty, wake-robin, shooting-star, and buttercup, or later in the season to gather the blue-bonnet, goldenrod, morning glory and bitter-sweet. Less romantic but equally suggestive are such common names as devil's club, Indian paintbrush, skunk cabbage, or choke cherry.

A philological study of flowers carries us beyond the commonly understood English names, to show that the ancients likewise used expressive terms. The heliotrope turned with the sun, the tulip was a turban, the gladiolus a sword-lily, the chrysanthemum a golden blossom, the anemone nodded with the breeze, and the phlox was a flame flower. In this connection two other early English names are noteworthy, aster a star, and daisy the day's eye, dedicated to the sun.

VIII. Emerging Words

When words pass from one language to another the changes in pronunciations sometimes lead to erroneous interpretations of their meaning. The term crayfish originally did not suggest a fish but came into usage as the English attempt to say *crevice,* the Old French name for this animal, which in Modern French is called *écrevisse.* Via old German *chrebiz,* which developed into Modern German *Krebs,* the crustacean again entered the English language as *crabba,* later becoming crab. The Teutonic *krabbeln,* meaning to scratch, supplied the term crawl, as well as the third appear-

ance of the animal, this time the crawfish.

The classical names for the crab were the Greek καρκίνος, *karkinos* and κάραβος, *karabos,* and the Latin *cancer.* Because of a fancied resemblance of the swollen veins in the disease cancer to the spreading legs of a crab, the Latin name for
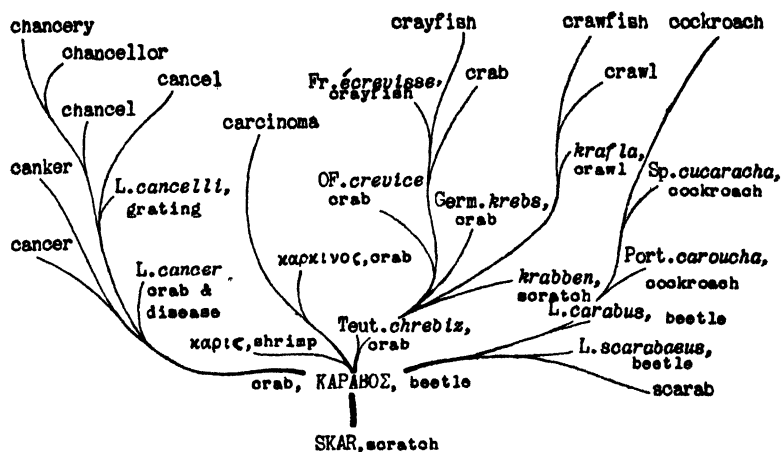
CHART III. The philological race-track where a Chancellor, a Crayfish and a Cockroach started from scratch.

the crab has been used for two thousand years for this malignant growth. A modification, canker, is applied to a tumorous plant disease and more recently the Greek καρκίνος has furnished the term carcinoma for medical terminology. From the suggestion of the sprawling legs of *cancer,* the crab, the Romans derived a word *cancelli* for a grating, trellis, or lattice. The crosshatching led to the English idea of cancellation, while the framework became the chancel of the church as well as the bars or railings behind which a chancellor took his station; hence the term chancery for a courtroom.

From the other Greek related word for crab, κάραβος, which also was applied to a hard-shelled beetle, there has descended a line of terrestrial insects. The Latin transliteration, *carabus,* is still used by entomologists for a group of caterpillar-hunting beetles, and the derivative *scarabæus* is

familiar to all as the shortened word scarab. Entering the Romance languages the identity of the insect changed with the pronunciation, for the Portuguese *caroucha* and the Spanish *cucaracha* are now names applied to the insects which in England received the nearly similar term cockroach. In Europe dark colored roaches still bear the common designation "black beetles." The English word cockroach has therefore no connection with the suggestion of cock, or male, but is only the abortive attempt to pronounce the Spanish *cucaracha.*

The Latin term *lacerta* for lizard became *lezard* in French before it became lizard in English. *Lacerta* was modified into *lucertola* in Italian, and *lagarto* in Spanish. The American attempt to pronounce the Spanish *el lagarto,* the lizard, resulted in alligator.

The sea tortoise was called *tartaruga* in Portuguese and *tortuga* or sometimes *tortola* in Spanish. As a sort of compromise these words developed into tortoise when coming to England. A further corruption of tortoise resulted in turtle, the change being influenced by the previous use of the word turtle for a kind of pigeon. Thus the Latin words *testudo,* tortoise, and *turtur,* dove, both culminated in the English word turtle, but by entirely different pathways.

The Portuguese called the pelican "the bucket bird," or *alcatraz.* Since the name pelican was already in use in England, borrowed directly from the late Latin *pelecanus* and Greek πέλεκαν, *pelekan,* the introduced word *alcatraz* became modified to albatross, and was applied to a different marine bird, which however lacked the bucket bill, the distinctive feature of the name.

The name penguin originated in Wales, though it now applies exclusively to birds of the Southern Hemisphere, species unknown to the originators of the term. The word penguin literally means having a white mark on each side of the head, which was a distinctive feature of the now extinct great auk to which the name first referred.

A toadstool, commonly regarded as a seat for toads, etymologically has nothing to do with either, as the word is a Germanic term meaning "death sprout." Gooseberry is

not to be associated with geese for it is only a corruption of the early English *groseberry,* which was only the French *groseille* adapted to suit English pronunciation. The botanical name of the gooseberry is Grossularia. The word cabbage is a simplification of the Old French *chou cabus* which was derived from *caput,* meaning headed cabbage. The Greek term γλυκυ-ῥίζα, Latinized *glycorhiza,* literally sweet-root, after passing through Italian *liquirizia* emerged as liquorice and licorice, the last from OF. *licorice.*

The attempt to pronounce the French *chate pelose* resulted in caterpillar. The French term was derived from the Latin *catta pilosa,* or hairy cat; just as today we popularly call such larvæ woolly bears. The word catkin, meaning little cat, is from the middle Dutch *katteken.* We still call the soft catkins of the willow "pussies."

An extreme case of emergence is illustrated by the plant which furnishes cloves, known to the Greeks as καρυόφυλλον, *karyophyllon,* or nut-leaf. In Latin this became *caryofolium,* in Italian *garofano,* in French *girofle,* in early English *giroflower* and in modern English gillyflower. Not only has there been a progressive change in pronunciation but the identity of the plant has shifted, the name gillyflower being now applied to various species, though mostly to plants related to the clove.

In the evolution of animals specialization is often attained by simplification or loss of characters. Archaic structures, useful in their time, have become outmoded. Similarly, in the evolution of language some words have lost so much of their original identity as to be almost unrecognizable.

The word pod looks like a good old English monosyllable, but it is condensed from peasecod, a pouch for peas; hence a pea-pod is a repetitious statement. Surgeon in spelling does not resemble its prototype χειρουργός, *cheirourgos,* literally one who works with his hands, referring to any art or handicraft. On its way to English the word underwent changes, Latin *chirurgus,* French *chirurgien,* Middle English *chirurgeon,* and Modern English surgeon. The first surgeons were etymologically chiropractors.

Other examples of telescoped words are office for *opus*

facio, I do work; retrorse, for *retro versus,* turned back; capillus, for *capitis pilis,* hair of the head; grampus, for *grandis piscis,* great fish; ostrich for *avis struthio,* the large running bird; *cormorant* for *corvus marinus,* the sea raven; osprey, for *ossifragus,* bone breaker; marmot, for *mus montanus,* the mountain rat; polyp, for πολύπους, *polypous,* many footed; and hecatomb, for ἑκατόν βους, *hekaton bous,* a sacrifice of a hundred oxen.

The Anglo-Saxon *a nædre,* a snake, has become "an adder." Similarly, the Middle English *an ewte* (< AS. *efte,* eft) developed into "a newt."

IX. Uncertain Derivations

Obviously it is impossible to retrace step by step over centuries of time all the evolutionary changes in language. Modern Italian, French, Spanish and Portuguese are descendants of old Latin, and Latin inherited much from Greek. In biological metaphor the languages of Southern Europe have developed by adaptive radiation. Just as in Palæontology, connecting links are rare, and the etymologist must rely on his discretion to differentiate between convergence, or similarity in sound of words of unrelated meaning, and direct or cognate descent.

The derivation of the word caterpillar is a case in point. The general opinion of philologists is that a caterpillar is a hairy larva, but there is quite the possibility, as Wedgwood has indicated, that the "pill" part of the word refers to the habit of some caterpillars, isopods and millipeds to curl into a ball or pill on being alarmed, because in some parts of rural England it is such species that are called caterpillars, and elsewhere "pill-bugs."

The cochineal insect is a plump species of the genus Coccus, which lives on American cactus and which today is the main source of an edible red coloring matter. The name

cochineal has been variously ascribed to the Latin *coccinea,* scarlet; the Greek-Latin *coccum,* a red berry; and the Spanish *cochinilla,* a little sow, *i.e.* a sow-bug or pill-bug. The words carmine and crimson are said to be derived from the Greek *chermes* or *kermes,* the names of insects related to the cochineal; in Sanskrit *krimi,* insect, which is cognate with the Latin *vermis,* worm.

The strawberry propagates by runners and thus spreads over a field. This mode of reproduction may account for its name, since straw is derived from strew, Anglo-Saxon *streowian,* to spread. An European method of cultivating strawberries is to scatter straw over the plants, and this custom may have originated the name. It is not impossible that both explanations apply, and that the strawberry has had a polyphyletic etymology, to borrow a biological expression. Also it is not impossible that the idea of spreading straw over the plants was suggested by the early use of the name strawberry for strew-berry.

X. Mistaken Derivations

A little knowledge of foreign words sometimes leads to erroneous conclusions as to the derivation of newly encountered terms. Pediculosis means afflicted with lice (Latin *pediculus,* louse). A student confusing the word with autotomy, which means the ability possessed by some Crustacea to shed a leg upon provocation, derived pediculosis from *pes, pedis,* leg + "losis," to lose. Another student defined saltation (*saltus,* leap) as the determination of the age of the earth by the amount of salt in the ocean. Another remembered that stalactites and not stalagmites hang from the roof of caves because he supposed that the *lac* part of the word referred to milking a cow. Students are not alone in "pulling boners," as shown by a current headache remedy of which the name, simulating a medical term, translates

"no cure." Another illustration is that of a certain young entomologist, just learning to read, who astounded his mother by the book he had selected, until he announced its title as Advice to Young Moth-ers.

Many plausible mistakes in recognition are evident when foreign words have been introduced into the language. The muskrat is an odorous rat-like animal, but it owes its name only indirectly to these characteristics in that they probably influenced the corrupted pronunciation of its Indian name *musquassus,* meaning that it is red in color.

A tuberose is neither a rose nor tubular, but received its name from the Latin *tuberosa,* referring to the tuberous or bulbous roots; hence the alternative pronunciation less often heard, tu-ber-ose. The Jerusalem artichoke has no geographical connection with Jerusalem. It is a species of Helianthus, the sunflower, which produces edible tuberous roots. The Italian name *girasole* (turning with the sun) *carciofo* (artichoke) was corrupted to Jerusalem artichoke when the plant and its name came to England.

The mandrake, known to ancients as μανδραγόρας, *mandragoras,* has a curious distorted and thickened root, which sometimes forks into shapes suggestive of the figure of a person. The popular though erroneous identification of its name as "man dragon," supported by its use as a magical cure for barrenness, resulted in the superstition that the humanish roots sometimes shrieked when pulled from the soil. In an extreme form the superstition forbade the extraction of the roots from the ground on penalty of immediate death. Apuleius in the Second Century, B.C. developed an ingenious method for circumventing this direct calamity. He advised to loosen the roots with an ivory staff so as to disclose the mandrake's hands and feet and then tie a cord to the roots. "Then take the other end and tie it to a dog's neck so that the hound be hungry; next cast meat before him, so that he may not reach it except he jerk up the root with him." The dog thus sacrificed and the curse spent, it was safe to handle the roots, which were in demand as an aphrodisiac and as a narcotic in surgical operations.

Walnut means Welsh nut. The walnut belongs to the

genus Juglans, a contraction of *Jovis glans,* or Jove's nut. *Juglans regia* is the botanical name of the English walnut, thus resulting in a mixture of contradictory terms which announce a royal tree, English yet not English, that produces nuts for Jove.

Sumach (French *sumac,* Arabian *summaq*) is often pronounced "shumack." The similarity in the two names is accidental and is not due to carelessness, the colloquial name "shoemaker tree" probably antedating the coming to England of the French name *sumach,* because for ages the berries and leaves have been used for tanning leather.

The Greeks and Romans gave the name ἀψίνθιον, *apsinthion,* and L. *absinthium* to a plant whose aromatic leaves had an extremely bitter taste. A decoction of the leaves with wine was used as tonic bitters. This liquor accompanied the migration of man, and later, tempered with other aromatics, it became known as *vermout* in France, *Wermuth* in Germany, and *wermōd* in early England, the Germanic meaning being "to preserve the state of mind." The extreme bitterness of absinthe suggested its use for intestinal worms; hence by association the word *wermod* became changed to wormwood.

XI. Ancient Customs

Records of ancient practises are perpetuated by many words used in biological terminology. The testes (Latin *testis,* witness; testicles = diminutive) were called witnesses because oaths and compacts were testified in far away times by the ceremonial mutual laying of hands upon these organs. Likewise the Greek word for testicle, ὄρχις, *orchis,* is remarkably similar to the word ὅρκος, *horkos,* which means the object by which one swears, or the witness of an oath. The sacrum received the name sacred because this part of the body was regarded as particularly holy in sacrificial offerings.

Another transfer of a ceremonial term to biological usage is the word amnion, originally a cup for catching the blood of sacrificial victims (from ἀμνός, *amnos,* lamb). The jugular vein named from the Latin *jŭgŭlum,* throat, was called by the Greeks the sacrificial vein, φλέψ σφαγίτις, *phleps sphagitis,* and so the word for sacrifice, σφαγή, *sphăgē,* came to be used for throat as well.

Threshing grain is undoubtedly a tribulation, but to state that a tribulation is to thresh grain revives the literal meaning of two thousand years ago, when *tribulatio* meant the rubbing out of the kernels by means of a board studded beneath with sharp flints.

The Grecian prototype of the modern game of jacks was played with *astragaloi,* ἀστράγαλοι, made of the ankle bones of sheep. A form of this game is still called knucklebones; while the term astragali is used by anatomists for the small bones of the human foot below the ankle.

Ostracism now means at most exclusion from society, a sort of polite avoidance of companionship. Formerly it was a political measure (ὀστρακισμός, *ostrakismos*) whereby Athenian voters banished for ten years those they disliked, the ballots being pieces of clam-shell called *ostraca,* on which the voters wrote the names of such persons as had incurred displeasure. Scaphism was a Persian form of punishment in which bees and wasps played a part. It consisted of fastening a prisoner in a trough or hollowed tree (σκάφη, *skaphē,* a hollow tree, canoe, or other sort of vessel) and smearing him with honey, to be stung by the attracted insects.

Nomenclature is literally a calling by name, an assignment to the *nōmenclātor,* originally a Roman slave who announced to his master the names of persons he met, on the street or at home functions.

One of the common cicadas is known as Tibicen, a term meaning a flute-player. Looking back through the ages we realize that the first flutists were shepherds, who made their instruments, called tibiæ, from the shin-bones of sheep.

XII. Divination

Fortune telling early became an elaborate art, which left its impress on many words now used with altered meaning. Divination (<Latin *divinus, divus,* relating to a god, *deus*), interpreting the wishes of the gods, was done by trained specialists, who were variously named, according to the technic they followed. An *augur* (*avis,* bird + *garrio,* talk) prophesied from observing the chirping, singing and cries of birds. The ceremonial induction into the college of augurs was an inauguration. The *auspices* (*avis,* bird + *specio,* observe) interpreted the feeding habits and the flights of birds. The word auspicious has come to mean lucky, possibly because the *auspices* were also employed as witnesses at weddings and most frequently brought good reports from the birds on such happy occasions. The Greeks classified birds as ὄρνιθες, *ornithes,* common birds, and οἰωνοί, *oiōnoi,* birds of prey or birds of omen. The word omen is thought to have originated as a hybrid descendant of both expressions. Its sinister signification is perpetuated in the terms ominous and abominate.

Because sacrifices (Latin *sacer,* consecrated, holy + *facio,* make) formed a basic part of divination they were performed by specially trained prognosticators, called by the Greeks ἱερεῖς, *hiereis,* sacrificers or priests, and by the Romans *haruspices* (*harus* < ἱερός, *hieros,* victim + *specio,* observe). The *haruspex* interpreted also natural phenomena, such as lightning; the victims were slain by the *popa;* while the specialist who inspected the arrangement of the viscera was an *extispex* (*exta,* entrails + *specio,* observe). As part of the sacrificial ceremony the victim was sprinkled with holy meal (*mola,* millstone, also the grist from the mill). Hence immolate means offer in sacrifice; emolument, which formerly signified the toll in meal taken for grinding, now means compensation for any sort of labor; and a molecule is some-

thing smaller than a grain of flour.

Fortune telling was performed also by drawing or casting lots. The Latin term *sors,* lot, fate, fortune, destiny, appears in sorcery. The Greek term κλῆρος, *klēros,* drawing lots, has become clergy as well as clerk. Necromancy (νέκυο, *nekuo,* dead, ghosts + μαντεῖα, *manteia,* prophesy) originally was an oracle from the dead and bore no connotation of witchcraft. The term Black Art arose from the early English misspelling nigromancie. The name Mantis (μάντις, diviner) is used for an insect popularly known as the soothsayer or praying mantis, and the word maniac is another derivative. Hieromancy was divination by sacrifices. The word for the sacrificial victim (ἱερός, *hieros*) became synonymous for sacred and holy, and appears today without any suggestion of killing in the expressions hierarchy (holy government), hieroglyph (sacred, symbolic carving), hierology, etc.

XIII. Ancient Biological Beliefs

Inconsistent though some of the biological beliefs of the ancients appear to us now, we still continue to transmit them by employing terminology founded on superstition and erroneous judgment. The story (story is a short form of the word history) of the goose barnacle, which persisted through the Middle Ages, is a case in point. Barnacle is a diminutive form of *bernake,* an old English name for goose, alluding to the fable that geese of the Northern seas developed from goose barnacles. Thus a goose barnacle is literally a goose gosling. Barnacle goose is the name still applied to a species of goose that breeds in the far North, while Linnæus has perpetuated the fable by bestowing the name *Lepas anatifera* (the goose bearer) upon the barnacle.

Spermaceti is the name given to a fatty substance which occurs in the head of sperm whales. Formerly this was thought to be whale spawn; hence the name of the whale as

well as of the substance (σπέρμα, *sperma,* semen + κῆτος, *kētos,* whale).

When Linnæus named the walrus *Phoca rosmarus* he perpetuated not only its common name in the Scandinavian languages, *rosmar,* the sea-horse, but also the folk-lore based on the mistaken etymology of that term. Some historian of the Middle Ages, assuming that *rosmar* was derived from the Latin *rosmarīnus,* which means sea-dew, ascribed to the walrus the habit of climbing out of the ocean on to rocks by means of its tusks in order to subsist on dew. The English name walrus literally means whale horse. The animal is now known as *Odobænus* (*i.e.* tusk whale) *rosmarus.* The word *rosmarīnus* enters Biology again as the plant rosemary, in folk lore emblematic of remembrance. The name rosemary does not mean Mary's rose, because it was borrowed directly from the Latin *rosmarīnus* and therefore signifies "ocean spray."

The so-called tarantula of the southwestern states is a huge spider of horrifying mien. Its namesake in southern Europe presents a less repellent appearance, but according to age-old fable was regarded as capable of inflicting a maddening bite, which caused an hysterical condition known as tarantism. Like the present notoriety of the black widow spider, tarantism spread, until during the fifteenth, sixteenth and seventeenth centuries the numbers of people who believed themselves afflicted reached epidemic proportions. The prescribed treatment for tarantism was prolonged and active dancing to eliminate the poison; hence the disease became known as the dancing mania. The popular folk-dance known as the tarantella derives its name from the same district in Italy, Taranto (Latin *Tarentum*), that produced the tarantula spider, and by association is commonly regarded as the descendant of the frenzied treatment for spider-bite.

Early naturalists, not being provided with microscopes, were unable to observe the eggs of insects. Aristotle had much information about the habits of bees, but was unable to account for their reproduction, possibly because his belief in spontaneous generation led him to confuse the hive bee

and the bugonia, or "oxen-born bees." The bugonia of the ancients are now known to be the drone-fly, *Eristalis tenax,* but the early naturalists wrote more articles about this manifestation of spontaneous generation than about any other insects, except the true honeybee and the silkworm.

From the days of antiquity man has looked for medicinal plants to cure his ailments. Often his optimism in supposing he had discovered a specific remedy is manifest in the names of various plants. Aristolochia, once glorified as best for childbirth (ἄριστος, *aristos,* most excellent + λοχεῖα, *locheia,* for childbirth), still bears its disillusioned title. Scrophularia gained its name because it was thought to contain a specific cure for scrofula. Vincetoxicum, a kind of milkweed, at least in name is a conqueror of poisons (Latin *vinco,* vanquish + *toxicum,* poison). The word peony means medicinal (παιώνιος, *paiōnios,* healing), the plant being dedicated to Pæon, the god of medicine, later identified with Æsculapius, the earliest physician and son of Apollo. Of this Theophrastus, a disciple of Aristotle, wrote "the peony should be gathered by night for if a man is seen by a woodpecker while collecting it he is in danger of going blind."

The old "doctrine of signatures" held that medicinal plants were marked in some way to indicate their value to man, the problem being to discover and properly interpret the sign. Heart remedies, with "cardiac" or "cordial" qualities, were to have heart-shaped leaves or seeds; yellow flowers were prerequisite in a treatment for jaundice; leaves with swollen veins indicated a cure for varicocœl. Early medicine made use of hocus-pocus (which we now abbreviate hoax), but it was only by testing on living animals that medicinal properties were proved. Probably many prescriptions were tried on the dog, hence such botanical names as Cynoctonum (κύων, κυν-, *kyōn, kyn-,* dog + κτείνω, *kteinō,* kill), Cyanchum (κύων, dog + ἄγχω, *anchō,* strangle), as well as the English term dogbane.

Some names of plant genera used by Linnæus are herewith cited, translated to show the early ideas of the medicinal value of the plants. Since some two thousand years elapsed

from the period of the early physicians to the time when an exacting biological nomenclature was established, it is not at all certain that the names are now applied to the same species that entered into the pharmacopœas of the ancients.

Argemone (ἄργεμα, *argema,* a white-eye disease, for which the juice of a plant of this name was thought to be a specific remedy), Prickly Poppy.

Asplenium (ἀσπλήν, *asplēn,* the spleen), Spleenwort Fern.

Euphrasia (εὐφρασία, *euphrasia,* cheerfulness, a condition in convalescence made possible by the administration of this plant), common name Eyebright.

Panax (πᾶς, πᾶν, *pas, pan,* all + ἄκος, *akos,* cure, *i.e.* panacea), Ginseng.

Salvia (L. *salvus,* well), Sage, etc.

Solidago (L. *solido,* join together, make whole, *i.e.* esteemed as a vulnerary, from *vulnus,* wound), Goldenrod.

Symphytum (συμφύω, *symphyō,* cause to grow together, *i.e.* as a vulnerary), popular name Comfrey, derived from L. *confirmo,* make strong.

Xanthium (ξανθός, *xanthos,* yellow, a plant of this name serving as a dye for hair), Cocklebur.

Folk-lore is as conservative of tradition as any law of priority that science may impose. In their "common names," handed down by generations of unlettered observers of nature, many plants bear evidence of the search for health and longevity. Cancer-root, lungwort, heart's-ease, madwort, heal-all, self-heal, and balm are names that date older than history. The associations of the word balm are interesting. The word now means healing and is at present used for various aromatic medicinal plants, though it came from embalm, to preserve. The Latin form was *balsamum,* the Greek βάλσαμον, *balsamon,* an aromatic resin used in embalming. The Persian name for balsam is *mum,* hence the term mummy for an old dried embalmed body. The word mummy was formerly applied to the gum or gummy exudates seeping from such corpses, as well as to other scrapings from graves, which were supposed to possess magical medicinal properties, and were esteemed as especially valuable in the stanching of blood from deep wounds, in utter oblivion of asepsis.

XIV. Early Anatomical Conceptions

People of two thousand years ago had strange ideas of human anatomy. Many names bestowed by early medical writers indicate to us their confusion as to the structure and function of even the vital organs. The word cardia (Gr. καρδία, *kardia*) was applied to both the heart and the stomach, and we still perpetuate this ambiguity by using the expressions cardiac opening of the stomach and cardiac arteries near the heart. The first meaning of nerve (L. *nervus*) was sinew, and nervous (*nervosus*) then meant vigorous in strength. The term artery originally meant a windpipe which conveyed the pneuma or breath of life, an idea derived from the examination of slaughtered animals in which the arterial blood had drained off because of the severing of the jugular vein. The carotid artery of the neck was named from the Greek term κάρος, *karos,* for sleep or stupor, because of the belief that stupor was caused by pressure upon this artery.

The diaphragm, which was called by the Greeks φρήν, *phrēn,* was early supposed to be the seat of the intellect. Later when the heart and the brain were successively regarded as organs of intelligence, the *phren,* referring to the mind, was shifted from the diaphragm to the heart and finally became located in the head. The term outcrops in the word phrenology. The present popular idea of phrenology is that there is a correlation between localized brain functions and cranial contour. If the early Greeks had used the word it would have signified that the correlation began in the diaphragm.

A hypochondriac is one who is needlessly worried about his health, a mental condition formerly supposed to be caused by a sluggish flow of blood between the hypochondres, *i.e.* the spleen and liver. These organs were so designated because of their location below the χόνδροι, *chondroi,* or breast-

bone cartilages. Hysteria is another word originating in the early conceptions of anatomy, when it was thought that the mental conditions of women were controlled by the uterus (ὑστέρα, *hystera,* the womb).

In the attempt to establish physiological generalizations on their meagre understanding of human anatomy ancient anatomists postulated the theory of the humors. Various organs were supposed to secrete liquids, or humors, the liver producing blood, the lungs phlegm, the brain mucus, the gall bladder yellow bile or choler, and the spleen black bile or melancholia. The proportion of each of these humors determined a person's complexion (L. *complexio,* combination, from *cum,* together + *plecto,* weave) or temperament (*temperamentum,* mixture of the humors). When properly balanced the state of health was good. If improperly mixed a distemper resulted. Too much black bile produced melancholy, and too much blood brought on a sanguine temperament. Phlegmatic, bilious and choleric are other temperaments, or idiosyncrasies if the Greek expression is used (ἰδιο-σύγκρασις, *idiosynkrasis,* from ἴδιος, *idios,* peculiar to one's self + σύν, *syn,* together + κρᾶσις, *krasis,* a mixing or blending).

XV. Unnatural History

Nature faking is no new accomplishment. Ages ago people discussed the winged horse Pegasus as well as winged people, the angels, without regard to homologies in comparative anatomy. A frequent zoological impossibility was a hybrid combination of several animals, often wholly unrelated. For instance, the Dark Ages were illumined by the story of the Myrmeleon, or Ant-lion, the offspring of an ant-like mother and a lion-like father, whose duplex body was like a lion in front but posteriorly like an ant. "Being thus composed he is neither able to eat flesh like his father

nor herbs like his mother; therefore he perisheth from inanition." (From Theobald's *Phisiologus,* about 1030 A.D.)

In this category of fabled monsters come the centaur or man-horse combination, the minotaur or man-bull, the satyr or man-goat, the mermaid or woman-fish, the sphinx or woman-lion, the chimæra combining lion, goat and serpent, the griffin or eagle-lion, the hippogrif or eagle-horse, and the Hippocampus, a name now given to the little sea-horse, but formerly applied to marine monsters with the anterior half horse and the posterior portion fish, which were driven by Neptune and ridden by the Nereids.

Other strange animals which acquired exaggerated characters through oft repeated accounts were the Aspidochelone (ἀσπις *aspis,* shield, + χελώνη, *chelōnē,* tortoise), a sea tortoise so large that sailors mistook it for an island; the Salamander that could enter fire unscathed, and even quench it, a story probably originating from the emergence of salamanders when fires are built on the ground where they have been hiding; the Enhydris, a sort of otter that enters the mouth of a crocodile to kill it; the Basalisk, a desert animal whose breath was fatal; and the Charadrios (Χαραδριός), a bird that could presage death or recovery from sickness.

Some of the visionary animals may have been an intentional improvement on nature, such as Pegasus with wings added to an already complete horse. Others were imaginative extensions of zoological misapprehension, often intended for religious instruction. The devil with cloven hoofs, forked tail and frontal horns has undoubtedly served a materialistic purpose as effectively as the bizarre dragons of the Chinese. The unicorn probably resulted from a misinterpretation of a profile representation of a two-horned animal, where the ancient artist showed only the nearer of the pair of horns. The interest manifested in the unicorn prompted a flourishing racket, for druggists announced the curative properties of the horn and then filled prescriptions at fabulous rates, using the single tusk of the narwhal for the purpose. Monsters such as these were not exclusive creations of the past, for periodically the sea-serpent raises its head above present-day waters.

Most of the imaginative combination animals of the ancients exhibited a metameric form, a tandem polymorphism, in which one section of the body was replaced by the corresponding section of the other species. Sometimes, as in the centaur, there was an augmentation, where human arms were added to the four legs of the horse. Antimeric repetitions of parts are more rare, but occur in Cerberus, the multiheaded dog on guard at the portals of the infernal regions, the three centimani, Briares (Hurricane), Gyes (Earthquake) and Cottus (Volcanic Eruption), each of whom possessed a hundred hands and fifty heads, as well as in the Buddhas of Asiatic prestige, who developed up to a thousand arms.

XVI. Color Terms

The names of many colors have had a biological background. Since flowers are brightly and characteristically colored, such names as violet, rose, lilac, lily-white, heliotrope, pink and lavender have come into general use. The flower called the pink derived its name from the pinked, *i.e.* peaked, edges of the petals; the flower then giving the name to the color. Pink-eye, a disease of the eyes, was not named because of the redness of inflammation, but the name was derived from pinch-eye, referring to the half-shut condition. The flowers listed above bestowed their names on the colors associated with them. In a few instances colors have been the source of the names of plants. The orange, for example, received its name from its golden color, the word being derived from Latin *aurum,* gold. The carnation was so called because of the flesh color (*carnatio*) of its flowers. Lavender comes from the Latin *lavanda,* a washing (laundry is cognate), the sweet smelling leaves from time immemorial having been laid between cleaned laces and linens.

Fruits and nuts have also contributed to standard color

terms, as evident in such words as apple green, chestnut, coffee-color, lemon yellow, olive, pea green, strawberry red, walnut, etc. The reddish brown color called sorrel is from a Germanic *sor*, withered, and literally refers to the color of dead leaves. It is cognate with sear. Green and grow have come from the same pre-Anglo-Saxon root. Drab, from the French *drap*, cloth, indicated the color of undyed homespun linen or woolen cloth. Tawny is equivalent to tanny, meaning sun-tanned.

Buff is part of the word buffalo, meaning at first buffalo- or ox-hide and then the brownish yellow color of such leather. Brown is Anglo-Saxon *brun*. It has been suggested that originally this meant bear-colored. The not very ancient Dutch word *bruin*, meaning brown, has entered the English language to become synonymous with bear. Dun is Anglo-Saxon *dun*, dark brown. The translation of the word donkey is a very little dun-colored horse. Vermilion means little worm, probably referring to bloodworms of this color. The brown tone called puce literally means flea-color. Seal, canary, peacock blue, sepia and coral are other simple references to animal coloration.

The use of the word cardinal for a brilliant red color, as for the cardinal bird or the cardinal flower, has had a devious history. Originally the word *cardo* (*cardin-*) meant a hinge, as is used for the cardo or hinge of a clam shell. In the church a Cardinal, through whom its government hinges with the Pope, is distinguished by vividly red vestments; hence the transfer of meaning from hinge to color.

XVII. Terms Relating to Education

College students may be interested in the history of several commonplace expressions pertaining to their school life. The word college comes from Latin *collēgium*, a meeting of associates, *i.e.* a corporation, club, guild, or labor

union, as well as a society of scholars, the members of any such group being colleagues (*collēgæ*) or partners. A school originally meant leisure time (σχολή, *scholē*), then successively learned leisure, a dissertation produced in spare time, a debate or lecture, and, by metonomy, the place where lectures are given. A seminary at first was a "seed garden," before the word was used for a nursery or kindergarten. Seminar has the same derivation. A group of schools and colleges we now call a university, the meaning of *universitas* being "turned into one."

Campus means an open field, but specifically was appropriated for college use from The Campus, or *Campus Martius* at Rome, where military drills, games and elections were held. A gymnasium (γυμνάσιον, *gymnasion*) is literally a place for naked exercise (γυμνός, *gymnos* naked). The Roman running track was the *curriculum*, the same idea recurring in the term course (L. *cursus*, a running). Study merely meant zeal, earnestness and enthusiasm; hence a course of study as we now say it, historically meant interest in athletics. When the Greeks put on a show at the public games they called it θεώρημα, which we pronounce theorem. Watching such a performance was θεωρία, or theory. The place for the games was a θέατρον, or theatre. There is another interesting word in this group, τά θεωρικά, money given from the public treasury to poor people to pay for their seats at the theatre, a practical application of theory, foreshadowing some "relief" methods of to-day.

In Roman times the word *ludus* was used for sport, game and school, the schoolmaster being *ludimagister*, a director of athletics primarily. The word ludicrous (L. *ludicrus*, done for recreation) comes from the same source. Pedagogue is Greek (παιδαγωγός, *paidagōgos*), literally a child leader, a slave who conducted a boy to and from school. From the same word, παῖς, a child, comes encyclopædia, meaning a circle of child information. The Roman *tutor* (from *tueor*, protect, guard, care for), was the guardian of a minor, or the caretaker of a feeble minded person; tuition being "protection of the young." Before the medical profession became over-crowded the word doctor simply meant teacher. Faculty

comes from the Latin *facultas,* ability, and *facilis,* which primarily meant easy, but also, at least in Roman times, signified skill, dexterity, cleverness, friendliness, accessibility, willingness, courtesy, and good nature.

Education is not derived from *edūco,* to draw out, as often stated, but from *edŭco,* to lead on, bring up, or rear. Instruction comes from *instrŭo,* to build into, inform, prepare, teach, instruct. Institution is from *instituo,* to place into, arrange, begin, undertake. Formerly English children were instituted, as well as educated and instructed.

A lecture was originally a reading, the lecturer (*lector*) reading aloud from books. Lesson arrived via the French from the same Latin term. Text comes from *textum,* woven, indicating the intertwined thoughts of the author (*auctor,* literally one who makes his ideas grow). Dissertation (*dissertatio,* a setting asunder) was the early term for a debate. The dignity of a modern symposium would be shocked by its prototype, the συμπόσιον, a convivial banquet (< πόσις, *posis,* a drinking bout). The first use of the word examination was for a swarm of bees (*examen*: *ex,* out + *agmen,* movement). A secondary application of the word was for a pointer on a balance, hence a weighing or testing. Essay comes from the same source and meant an experiment or first trial before it indicated a completed written report. A laboratory, from *elabōro,* signifies a place for painstaking, hard work, where experiments and tests are conducted. Experiment simply means "to try out," but the word test has a peculiar history. *Testa* was the term for a pot made of burned clay, or a tile, or a potsherd, *i.e.* a broken piece of such a pot, which was called by the Greeks ὄστρακον, *ostrakon,* and was used in place of shells in voting (see ostracism, page 27). Biologically, testaceous means either clay-colored or covered by a test or shell. The *testa* pot was used in alchemy as a crucible, and later chemistry developed the test-tube.

Writing materials were scarce in olden times. Paper (πάπυρος, *papyros*) was laboriously made by peeling strips of inner bark, called βίβλος, *biblos,* from the stems of papyrus and cementing them into scrolls, or βιβλία, *biblia* (*cf.* Bible and bibliography). Single sheets of paper (χάρτης, *chartēs*), fur-

nished the term charts. Imagine civilization today deprived of an abundant supply of paper! Parchment was prepared by scraping and stretching animal skins; vellum originally was made from calf-skin. A parchment manuscript which had been erased by scraping and used over again was known as a palimpsest (πάλιν, *palin,* again, and ψηστός, *psēstos.* scraped, rubbed). Writing was done with ἔγκαυστον, *enkauston,* or in Latin, *incaustum,* now abbreviated "ink," a cooked mixture of nut galls and $FeSO_4$ (καυστός, burnt; *cf.* caustic). A pen was constructed from the quill of a feather (*pinna*), whence the name pen. A pencil, in the original sense of a paint-brush, is literally a very little penis (*penis,* tail; *peniculus,* little tail or brush; *penicillus,* a very fine paintbrush). From the use of lead as a marker came the term lead-pencil, now doubly a misnomer, since a modern pencil contains graphite and not lead and is no longer a brush. The Greek term γραφεῖον, *grapheion,* would be more appropriate, though it originally referred to a stilus for writing on wax plates. In this connection the uses for India rubber far transcend the meaning of its name. Introduced to Europe from the West Indies it was regarded only as a novelty for rubbing out pencil marks.

The *stīlus,* or engraving implement (contraction for *stiglos;* cf. *stigma,* a mark) used for marking on wax tablets, is responsible for the mis-spelled term style, *i.e.* the manner of expression. (See character, p. 9.) A scribe is literally one who scratches lines on a soft surface as some scribblers still do. The word write is Anglo-Saxon, and also indicates to scratch. The Runic marks commonly made on staves of soft beechwood (German *Buchstaben,* beech sticks, still means the letters of the alphabet) gave rise to the word book (Anglo-Saxon *bok,* beechtree, also book). The Latin names for letters and handwriting (*līteræ* or *litteræ*) date back to the verb *lino, litus,* meaning to besmear. Arithmetic, ἀριθμητικός τέχνη, was the art of numbers, mathematics (μαθηματικός) meant fond of learning, especially science and mathematics, but calculation is a Latin term, from *calculus,* a small rounded stone, indicating that pebbles were an early aid to computation.

Grades and graduation are still accomplished by degrees, all three expressions having been derived from *gradior,* step by step. A diploma (δίπλωμα) is literally a paper folded double, and was originally a passport presented by the government to travelers, *i.e.* diplomats. From the Middle Ages the presentation of a diploma conferred with dignity the degree of *Artium Baccalaureus,* the title bachelor implying a young man, though centuries before a bachelor was a farmer, and still earlier a cowherd (*bacca* < *vacca,* cow). A student in Roman times was a *discipulus* (from *disco,* to learn), while learning was *disciplīna.* A sophomore is a contradiction in terms, meaning σοφός, *sophos,* wise + μωρός, *mōros,* foolish. An alumnus in early times was literally a nursling or foster-child (from *alo,* to nourish), though its present connotation applies to one weaned from *alma mater,* the nourishing mother.

XVIII. Accentuation

Perhaps the most important result from delving into the derivation of scientific terms is an understanding it affords to accentuation and pronunciation. There are certain long vowels, like the Greek eta and omega, and certain diphthongs, whose influence has lasted through the ages, despite popular though unwarranted tendencies to shorten them and to shift the accent to other syllables. An understanding of the word at its source assists, therefore, not only in memorizing the word, its definition and application, but also gives the clue to its proper accentuation and pronunciation. For example, an epime'ron is a part of the body of various Arthropods located above the leg, and this term is accented on the penult, or next to the last syllable, because the Greek word for thigh, μηρός, *meros,* was spelled with the long e, eta. But the words trim'erous, Heterom'era and Pentam'era are to be accented on the antepenult, never on the penult, be-

cause they are derived from the different Greek word, μέρος, *meros,* which means a part, and is spelled with the short e, epsilon. Similarly, Di'nosaur and Dĭnoflagĕlla'ta are derived from wholly different terms, δεινός, *deinos,* meaning terrible, and δίνη, *dine,* meaning whirling, and hence have different pronunciations.

Another citation of the assistance to correct accentuation afforded by a knowledge of the derivation of words is furnished by the "cera" names. The Greek κέρας, *keras* for antenna or horn, is spelled with the short e, so a certain fly with pointed antennæ is called Acroc'era and the large animal with the horn over its nose is the rhinoc'eros; but the wasp Cerce'ris, appropriating the old Latin name of a bird, and the honeysuckle Lonice'ra, named after the botanist Lonizer, are accented on the long e of the penult.

Etymology clarifies the pronunciation of the confusing "-opus" names. The long o of Œdo'pa (swollen face) as well as of Chryso'pa (green eye) comes from ὤψ, *ōps,* meaning face, eye, or countenance; and of Octo'pus (eight legged) from ὀκτώ, *oktō,* eight; but Œd'opus (swollen foot) and Dolich'opus (long foot) have the o of the penult short, representing the omicron of οἶδος, *oidos,* a swelling, and δολιχός, *dolichos,* long.

While the Greek vowels ε, η, ο and ω, and some of the diphthongs have had an important influence on English pronunciations, the Greek accents have had almost no effect. Scientific terms have been introduced into English mostly by way of Latin and hence accentuations conform usually to the Latin rule to stress the penult if that syllable is long, otherwise to accent the antepenult. A long syllable in Latin is one that contains a long vowel or one whose vowel is followed by two complete consonants.

There has been a frequent popular tendency, following Roman times, to shift the accent back toward the beginning of words. Hence long continued usage sanctions such popular pronunciations as oc'topus, neurog'lia, tra'chea, and ex'cretory, instead of the etymologically preferable octo'pus, neurogli'a, trache'a, and excre'tory. This tendency to shorten the vowel of an accented penult is again manifest in

the accepted pronunciations carot'id, opisthot'ic and parot'id, although the o of the penult was originally omega. Other illustrations of this tendency are the adjectives um'bonal (from *umbo, umbōnis*), umbil'ical (from *umbilīcus*), and ves'ical (from *vesīca*). The recession of the primary accent is further exemplified by compound polysyllabic words, such as chro'matophore, met'amerism, pter'idophyte, tryp'anosome, etc. The dictionaries, however, prefer eryth'rocyte.

Sometimes the pronunciation of a technical term follows classical usage while the popular application of the term is colloquially affected. Anemo'ne, the genus, softens to anem'one, the general name for the flower. Ar'butus, the tree, follows the Latin, but the trailing vine is called arbu'tus. Gladi'olus is correct botanical pronunciation, though it yields too often to the colloquial gladio'lus, or the evasive abbreviation "glad." The octopus has already been noted; as a genus it is Octo'pus, but as a common devil-fish it is called oct'opus. The squid often used for laboratory dissection is Loli'go, even though students and instructors have bestowed on it an unnecessary popular designation, the lol'igo. A few of the plant genera which have withstood frequent attempts to shift the accent to the antepenult are: Achille'a, Eri'ca, Heracle'um, Lonice'ra, Myri'ca and Potamoge'ton.

XIX. Pronunciation of Taxonomic Names

Because all taxonomic names are Latin in construction they conform in pronunciation to the relatively few rules which guided the Romans. Though some of the regulations are not invariable, fortunately they are not overridden with many exceptions such as occur in English. The rules for the accentuation of Latin words, fixed over two thousand years ago, apply equally to Neo-Latin taxonomic terms and cannot now be modernized, even to meet the colloquial desires of

some biologists who may not be acquainted with Latin. Briefly stated, the more useful rules affecting the pronunciation of the names of animals and plants are listed, with examples of their application. Indifference in pronunciation of such names is no more excusable than disregard of the other features of the nomenclatorial code.

SYLLABICATION. 1. All Latin words have as many syllables as there are vowels and diphthongs. An-tho-my-i'id-æ; O-phi-ur-oi'de-a.

2. Compound names are accented like unified words, without reference to the accentuation of their constituent parts. Pa-chyb'ra-chys, not Pach"y-brach'ys (παχύς, *pachys*, thick + βραχύς, *brachys*, short); Rhyn-chos'por-a, not Rhyn"-cho-spo'ra (ῥύγχος, *rhynchos*, snout + σπορά, *spora*, seed).

3. Syllables are open when they end in a vowel: Neu-ri-go'na; or closed when they end in a consonant: An-thox-an'thum; Os'cin-is.

ACCENTUATION. 1. The penult is accented when that syllable is long in quantity, or if the name consists of only two syllables.

a. The syllable is long by nature if it contains a naturally long vowel or a diphthong. Eri'ca; Hyperi'cum; Lutri'næ; Mephi'tis; Nymphæ'a; Periplane'ta; Potamoge'-ton.

b. A syllable is long by position when its vowel is followed by two consonants (except a mute and a liquid), or by the double consonants x or z. Cybis'ter; Helian'thus; Hibis'cus; Nelum'bo; Tritox'a; Agromy'za.

2. The antepenult is accented when the penult is short by nature or is common in quantity.

a. A syllable is short in quantity when its vowel is followed by another vowel, or if otherwise its vowel is naturally short, *e.g.* the penult of: Dan'a-us; Epib'a-tes; Noc'tu-a; Pi'er-is; Pro'te-nor; Pyr'o-la; Ro-sa'ce-æ.

b. A syllable is common in quantity when its vowel, not naturally long, is followed by a mute (b, c, d, g, k, p, q, t, ch, ph, th) and a liquid (l, r), *e.g.* the penult of: Cu-ter'e-bra; Eph'y-dra; Ge-om'e-tra.

3. A secondary accent is given in long names, which is

not to be a pitch accent in sing-song fashion, but a stress accent on the second syllable before the primary accent when that syllable is long in quantity or begins the word, otherwise on the third or fourth preceding syllable. Di-aph″er-o-me′ra; Sel″a-gin-el′la; Strat″i-o-my-i′id-æ; Stron″gyl-o-cen′-tro-tus.

QUANTITY OF VOWELS. 1. Vowels are long by nature or position, and are to be pronounced preferably with their long English sounds under the following conditions:

a. Vowels are long by nature when long in the original source and not followed by two consonants, thus occurring always in open syllables, *e.g.* the penults of: Cratæ′gus; Eume′rus (μηρός, *mēros,* femur); Megathy′mus (θυμός, *thȳmos,* soul); Scipo′pus (σκίπων, *skipōn,* staff).

b. In penults before a single consonant, or a mute and a liquid (except i or y, see 2 d, following). When this vowel is long by nature the penult carries the accent. Cali′-go; Formi′ca; Na′trix; Pemphi′gus; Phylloxe′ra; Spirogy′ra; Thamno′phis. The antepenult carries the accent when the vowel of the penult is short by nature, although it is to be given the unstressed long English sound for clarity of enunciation desirable for scientific names. Can′tha-ris; Chrysom′-e-la; Crot′a-lus; El′a-ter; E-rig′e-ron; Melan′o-plus; Nom′a da; Ox′a-lis; Pachym′e-nes.

c. In English, though usually not in Latin, the long sound is given to accented a, e, or o, before a single consonant (or a mute and a liquid) followed by two vowels, the first of which is e, i, or y, and the consonant is joined to the syllable following the accent. Ara′ne-us; Batra′chi-um; Ceta′ce-a; Hama′dry-as; Leca′ni-um.

This rule is not restricted to taxonomic words, but applies quite generally, even when the vowels are short in the classical sources, *e.g.* a′que-ous (L. *ăqua*); me′di-um (L. *mĕdium);* neuro′gli-a (Gr. νεῦρον); œsopha′-ge-al (Gr. φαγ-). Among the rare exceptions are an′ion, glad′iator and pet′iole. The tendency to give the long sound to a, e, or o, under the conditions cited, has been popularly extended to the secondary accent, even when the vowel by inheritance was originally short, *e.g.* ge″ne-al′o-gy (Gr. γενεά); pa″le-on-tol′o-gy (Gr. παλαι-); ste″re-op′tic-on (Gr. στερεός); te″le-ol′o-gy (Gr. τέλεος).

d. As a result of contraction vowels apparently short by position become long by nature and so affect the accent. Achille'a (Gr. 'Αχίλλεια); Aristolochi'a (Gr. λοχεία, childbirth) ; Cythere'a (Gr. Κυθέρεια) ; Heracle'um (Gr. 'Ηράκλειον) ; Hippodami'a ('Ιπποδάμεια); Paracli'us (Gr. κλείω, shut).

e. U is pronounced long in any syllable not final when occurring before a single consonant or a mute and liquid, except bl. Cu'cu-jus; Mu'rid-æ; Nitid'u-la; Ophiu'ra; Quadru'ma-na; Ranun'cu-lus.

f. Vowels short by nature may require long English sounds:

I. Before z. Agromy'za; Madi'za.

II. When a vowel (other than unaccented i or y) is followed by another vowel. Hepi'alus; Procy'on; Tine'ola.

III. Under the a, e, o rule cited in paragraph c above. Chenopo'dium (Gr. ποδ-); Hydro'bius (Gr. ὑδρο-βίος); Tachydro'mia (Gr. δρομεύς, runner).

2. Vowels are given their shorter English sounds under the following conditions:

a. Before two consonants (except sometimes a mute and a liquid), including x and sometimes z as double consonants. Note that such syllables are long in determining the accent, but their vowel is pronounced short. Bras'sica; Gram'pus; Hypox'is; Notonec'ta.

b. Vowels long by nature must sometimes be pronounced short because of their location in closed syllables. Allognos'ta (Gr. γνωστή, friend); Diop'sis (Gr. ὤψ, eye); Glossi'na (Gr. γλῶσσα, tongue); Sphex (Gr. σφήξ, wasp); Troc'tes (Gr. τρώκτης, epicure).

c. Usually in accented antepenultimates before one or more consonants. Artemis'ia; Botrych'ium; Pyroch'roa; Ran'atra; Scol'ytus; Tardig'rada. In this category come properly all zoological family names whose stems end in a consonant, even though the stem vowel is long by nature. Balæn'idæ (Balæ'na); Taban'idæ (Taba'nus); Trypet'-idæ (Trype'ta).

Sometimes, in order to indicate that the vowel of the antepenult is long by inheritance, it is etymologically proper to pronounce it long. Bo'vidæ; Fe'lidæ; Psy'chidæ; Cne'modon; Me'rodon.

d. Unaccented i or y in any open syllable except the

first and last. As'ci-a; Ec'i-ton; Frax'i-nus; Lam'py-ris; Mus'ci-dæ; Tach'i-na.

But unaccented i beginning a name is often pronounced long. I-ba'lia; I-rida'ceæ; I-sop'tera.

e. The diphthongs æ and œ, long by nature, are pronounced like the single letter e in similar situations, and are given the short sound in closed syllables. Æsch'na; Æs'culus; Œd'ipus; Œd"ogo'nium; Œs'tridæ.

XX. Mispronunciations

Usage, initiated by the careless, when continued long enough has been responsible for the authorization given to many mispronunciations. To say hor'mo-ne, pto'ma-in and co'ca-ine is correct, but it is popularly regarded as pedantic. Dictionaries often accede to public opinion, accept careless usage as if it were a mandate from the people, and, disregarding their important function of stabilizing the language, recognize colloquial mispronunciations as a second choice. Despite the frequent pronunciation of data and strata as if they were spelled datta and stratta there is as yet no assent for such errors. The first a is long, but in such cases it is optional whether to sound the a as in date, or more broadly as in father. A distinction is to be made between the accentuation of syllables, which is self-regulated, and the intonation of the individual letters, concerning which there are differences in personal preferment. It is apropos to mention that data and strata are plural nouns and should never be used with verbs in the singular. It is as incorrect and jarring to the ear to say "this data shows . . . " as to say "this geese is . . . ." College men sometimes are lax in pronouncing every syllable of the words lit'er-a-ture, lab'o-ra-to-ry, par-tic'u-lar-ly and hy'gi-ene, due to affectation or to carelessness in observation of details. Such are bad habits it is best to avoid.

There are certain recognized philological trends in accentuation, division of syllables and lengthening or shortening of vowels which have been responsible for changes in pronunciation when words have been transferred from one language to another. When long continued usage based on such tendencies has brought about the practical acceptance of an incorrect pronunciation it is still considered good form to follow the pronunciation based on etymology. Most people would say system'ic, tra'chea and zy'gospore, but it would not be considered incorrect to say syste'mic, trache'a and zyg'ospore. On the other hand when usage coincides with etymology, it is regarded unscholarly to depart from accepted standards. As yet there is no biologists' dialect to excuse such ear-twisters as herbivo'rous for herbiv'orous, Arthropo'da for Arthrop'oda, citrico'la for citric'ola, schi'-zopod (with soft ch) for schiz'opod (the Greek ch is always like k), or the many other commonplaces which are too frequently tolerated in the classroom. If a professor says "the duod'enum is located in the ab'domen," he may start a habit among many students, but the dictionaries still insist that the duode'num should be in the abdo'men.

A recently published dictionary has seriously erred in authorizing certain mispronunciations on the basis of answers to a questionnaire, and in disregarding many pronunciations etymologically correct. Investigators may be learned specialists in the field of Biology without being qualified to pass upon matters of correct pronunciation. The popular dictum that two wrongs do not make a right applies with increased pertinency when the wrongs are repeated many times. It is as unnecessary and undesirable to rule out the persisting effects of word lineage as to legislate evolution out of existence, even though the ignorant might vote to have it accomplished.

The technical expressions pertaining to Biology are used by educated specialists and therefore should not be subject to the vagaries of pronunciation into which laymen may drift. That scientists of the present generation are too busy to heed the conventions of careful speech and permit themselves the incongruity of indifference in linguistic presenta-

tion while meticulously careful as to scientific results demonstrates the need for the publication of the present work. This book is not intended to replace courses in Latin or Greek or to displace the dictionary, but it can be of service as a practical short-cut toward a unification of pronunciation for many biological terms.

Although most terms used in Biology do not offer difficulty there are some which confuse both student and instructor. The words which give most trouble are singled out and presented in the following list with their accepted pronunciations indicated. In cases of disputed pronunciation, the alternatives are given. The first marking is the one etymologically preferred; the second by usage has orthoepic acceptance. Many surprises will undoubtedly be revealed by a careful reading of this list. Most of us have mispronounced such words for so long that we feel there must be correctness in our method, and of course, there is to the extent that pronunciations, like everything else biological, are subject to mutational changes. But it is interesting to note how often among the multitude of variations in pronunciations and mispronunciations selection has been operating to conserve through the ages the parental forms for words. It is a biological dictum that in lineage the force of heredity holds truer than even the recurrent effects of diverting influences.

BIOLOGICAL TERMS OFTEN MISPRONOUNCED

abdo'men, ab'domen
accli'mate,
adult', ad'ult
al-lan'to-is
al-le'lo-morph
ane'mic, anem'ic
aq'ueous, a'queous
archego'nium (ch like k)
Arthrop'oda
at'okous
A'ves
az'ygous
bim'erous
bin-oc'u-lar, bi-noc'u-lar
bi-nom'i-nal
bip'arous
bi-pe'dal, bip'edal
biv'alent, biva'lent
bra'chium, brach'ium
Bryoph'yta

buc′cal
cal′yx, ca′lyx
cap′illary, capil′lary
ceph′alopod
cer′ebrum
Chætog′natha
chlo′rophyll
chro′matophore
com′missure
cœ′lōme, cœ′lom
cœlo′mic, cœlom′ic
cu′pule
Cyclostom′ata
da′ta
dig′itigrade
Din-o-flag-el-la′ta (g soft)
dis′sect (never dīssect)
duode′num (not duod′enum)
ec′dysis
ef′ferent
el′ater
Elode′a
el′ytra
en′zȳme, en′zym
epit′ōkē
eryth′rocyte
Eusta′chian (ch like k)
excre′tory, ex′cretory
fora′men
Formi′ca
gam′ete
gyn-e-ce′um, gyn-e′ce-um
hæ-mo-glo′bin, hem-o-glo′bin
heliot′ropism
hol′otype
Hom′arus
homos′pory
hor′mo-ne, hor′mone
hy′aloplasm
hy′brid, hyb′rid
ima′go, imag′inal
inter′calary
is′chium (ch like k)
jug′ular, ju′gular
laryn′geal, larynge′al
Loli′go
lori′ca
Lum′bricus
Malpigh′ian (g hard)
med′ullary, medul′lary
mel′anophore
mesenter′ic
mes′ial, me′sial
met′amerism, metam′erism
metamorpho′sis, metamor′phosis
mi′crogamete, mi-cro-gam-ete′
mi-me′tic, mim-et′ic
mol′ecule, mo′lecule
na′iad, nai′ad
nem′atocyst
neurogli′a, neuro′glia
nomencla′ture, nomen′clature
nu′chal (ch like k)
nucle′olus
octo′pus, oc′topus
œ-so-phag′e-al, e-so-pha′ge-al
œ′strus, es′trus
Ol′igocene
pal-e-o-lith′ic, pa-le-o-lith′ic
pal-in-gen′e-sis
paraph′yses
paro′tid, parot′id
peritone′um
Phanerogam′ia, Phaneroga′mia
pharyn′geal, pharynge′al
pi′neal, pin′eal
Pithecanthro′pus
pit′uitary, pitu′itary

Plantig'rada
preda'tor
protho'rax
Protoph'yta
Pteridoph'yta
pto'ma-in
pyr-e'noid
pyr'ethrum
Quadru'mana
rab'i-es, ra'bi-es
rem'igrant, remi'grant
Rem'ora
re-search'
respi'ratory, res'piratory
Schizoph'yta (ch like k)
sciat'ic (first c silent)
secre'tory
Sel''a-gin-el'la
sep'al, se'pal
ses'sile (not ses'sil-e)
spadi'ces
spe'cies (as if spe'shēz)
sper'matocyte
sper'matophyte
sphe'noid
spi'racle, spir'acle
sple'nic, splen'ic
ste'lē
ster-e-op'ti-con, ste-re-op'ti con
stiğ'mata

stom'ata
stom-o-dæ'um
stra'ta
strobi'lus
strob'ilate
su'berin
swim'meret
synde'sis
syste'mic, system'ic
sys'to-le
tel-e-ol'o-gy, te-le-ol'o-gy
thal'amus
tho'rax
trache'a, tra'chea
trichini'asis
trich'ocyst
troch'ophore
tryp'anosome
tym'panum
U'lothrix
umbili'cus
umbo'nal, um'bonal
univ'alent, univa'lent
veg'etal
ve'liger, vel'iger
ve'lum
ver'tebral
vesi'ca
vitel'line
zō-ol'ogy, not zoo-

zyg'ospore, zy'gospore

XXI. Suffixes

Most technical biological terms are compounded words containing two distinct stems. In a sense they therefore may

TABLE OF THE MORE USUAL BIOLOGICAL SUFFIXES

SUFFIX	DERIVED FROM	FORMING	SIGNIFYING	EXAMPLES
-ac	*-acus, -ακος*	adj.	relating to	cardiac, iliac
-acea,	n.&f. pls. of	noun	1. related to;	Crustacea, Gorgonacea;
-aceæ	*-aceus*		2. plant Fam.	Liliaceæ, Rosaceæ, Violaceæ
-aceous	*-aceus*	adj.	resembling	arenaceous, cretaceous, crustaceous, herbaceous
-acy	*-acia, -atia*	noun	state of being	accuracy, supremacy
-ad	*-as, αδος*	noun	1. number;	dyad, myriad, tetrad;
			2. fem. suffix	cycad, naiad
-ad	*ad*	adv.	toward	caudad, cephalad, ventrad
-age	Fr. *-age*	noun	state of being	appendage, cleavage, foliage, parentage, plumage
-al	*-alis*	adj.	pertaining to	diurnal, normal, ventral
-ales	pl. of *-alis*	noun	Plant Order	Graminales, Rosales, Violales
-an, -ean, -ian		adj.	pertaining to	Eimerian, human, Silurian, subterranean
		noun	1. one who;	biometrician, physician;
			2. one of group	amphibian, crustacean, protozoan
-ance	*-antia*	noun	state of being	abundance
-ant, -ent	*-ans, -ens*	adj.	being	absorbent, dormant, ruminant
		noun	one who	agent, assistant, dependent, inhabitant
-arium	*-arium*	noun	place for	aquarium, herbarium, vivarium
-ary, -ar	*-aris*	adj.	pertaining to	areolar, cellular, granular, ocular;
				capillary, hereditary, pulmonary, temporary
		noun	place for	apiary, aviary, formicary, ovary
-ata	pl.	prop. adj.	1. large group;	Branchiata, Chordata, Tracheata;
			2. Phylum	Cœlenterata, Echinodermata
-ate	*-atus*	adj.	possessing	aculeate, branchiate, craniate, tracheate
		noun	1. one who;	associate;
			2. chemical	chlorate, nitrate, sulphate
		verb	to make	assimilate, invaginate, innervate
-ble, -able, ible	*-bilis*	adj.	can be	flexible, heritable
-cle	*-culum*	noun	small	auricle, clavicle, spiracle, tubercle
-en		adj.	made of	earthen, silken, waxen, wooden
		verb	to make	harden, open, ripen
-ence	*-entia*	noun	state of being	luminescence, science
-er	*-arius*, etc.	noun	one who	cremaster, strider, sucker
-escent	*-escens*	adj.	becoming	pubescent, putrescent

SUFFIX	DERIVED FROM	FORMING	SIGNIFYING	EXAMPLES
-ic, -ical	*-icus, -icalis.*	adj.	relating to	aerobic, arctic, sympathetic; biological, botanical, zoological
-ics	*-ικα*	sing. noun	science of	optics, physics
-id		adj.	quality	acid, frigid
		noun	group member	acarid, annelid, arachnid
-ida	plu. of *-ιδης*	noun	Class or Order	Annelida, Arachnida
-idæ	-ides, *-ιδης*	noun	Family	Canidæ, Hominidæ, Muscidæ
-il, -ile	*-ilis*	adj.	condition	fossil; fertile, fluviatile, sessile
-ina, -ini	pl. of *-inus*	noun	Order, Suborder, etc.	Acarina, Forficulina; Crocodilini
-inæ	pl. of *-inus*	noun	Subfamily	Carabinæ, Passerinæ
-ine	*-inus*	adj.	pertaining to	bovine, canine, feminine, marine
-ish	*-esco*	verb	to make, give	flourish, nourish
-ism	*-ismus, -ισμος*	noun	doctrine	Darwinism, mechanism, metabolism
-ist	*-ista, -ιστης*	noun	one who	anatomist, botanist, parasitologist
-ite	*-ιτης*	noun	1. body division 2. fossil	basipodite, sclerite, somite; ammonite, trilobite
-ive	*-ivus*	adj.	relating to	native, nutritive
-ize, -ise	*-ιζω*	verb	make, give	organize, synthesize
-ment	*-mentum*	noun	result, agency	development, dissepiment, experiment
-oid		adj.	like	adenoid, anthropoid, colloid, coracoid
-oidea		noun	Superfam., Class	Asteroidea, Muscoidea, Vespoidea
-or		noun	one who acts	adductor, predator, receptor
-orial, -ory	*-orius*	adj.	serving for	ambulatory, auditory; repugnatorial
-orium, -ory	*-orium*	noun	belonging to place for	haustorium, tentorium laboratory, repository
-ose	*-osus*	adj.	full of	adipose, pilose, setose
-ous	*-osus, -us*	adj.	having, full of	amphibious, biramous, mucous, venous
-tion	*-tio*	noun	act, agent, state	adhesion, collection, secretion
-tude	*-tudo*	noun	state of being	altitude, amplitude, magnitude
-ty	*-tas*	noun	state of being	cavity, callosity, fertility
-ula, -ule	*-ulus*	noun	diminutive	blastula, gastrula; barbule, spicule
-ure	*-ura*	noun	result of action	culture, fracture
-y	adj. AS. *-ig*	adj.	made of, like	alary, horny, silky, spiny
	noun, *-ia,-*	noun	abstract quality	biometry, botany, cytology, microscopy

be bisected into a prefix half and a suffix half. Because such stem endings as -agogue, -fy, -iasis and -osis recur with frequent repetition students gain the impression that these endings are true suffixes. The term suffix should be restricted to the endings that have been definitely derived, not from stems, but from the indicators of case, number, gender, tense, mood, person, etc. The more usual suffix forms to be encountered in biological terminology are presented herewith. Many common English inflectional and derivational endings are omitted from the list because they are not particularly of biological application, such as: fill*ed*, fill*ing*, ful*ly*, ful*ness*, back*ward*, kin*ship*, star*ling*, bir*th*.

XXII. Prefixes

Many prefixes are readily understandable as independent English words which have become joined to other words to carry the meaning of the phrase. Such words, though used in Biology, are not part of its scientific terminology, as illustrated by *be*side, *forth*with, *for*ward, *out*side, *over*do, *to*ward, *un*do, *under*take, *with*out. Technical expressions, those constructed from Greek and Latin words, often make use of prepositions and adverbs for prefixes, as was commonly done in the original languages. To assist in locating the meanings of such terms, since the student is not expected to differentiate a foreign preposition or adverb used as a prefix from a stem at the beginning of a compound word, the prefixes are distributed alphabetically through the following pages along with the principal components of words.

The foreign prefixes which enter into biological terms are mainly the following:

From Latin: *a, ab,* from; *ad,* to; *ambi, ambo,* in two directions; *am,* around; *ante,* before; *circum,* around; *cum, com,* together; *contra,* against; *de,* from; *dis,* asunder; *dis,* not; *ex,* out of; *extra,* outside; *in,* in; *in,* not; *infra,* beneath;

inter, between; *intro,* within; *juxta,* near to; *ob,* against; *per,* through; *post,* after; *pre,* before; *preter,* beyond; *pro,* for; *re,* back, again; *retro,* backward; *se,* aside; *sub,* under; *super,* above; *trans,* across; *ultra,* beyond.

From Greek: *a,* not; *amphi,* on both sides; *ana,* again, through; *anti,* against; *apo,* from; *cata,* down; *dia,* through; *ec,* out of; *ecto,* outside; *en,* in, on; *endo, ento,* within; *epi,* upon; *hyper,* above; *hypo,* under; *meta,* beyond; *para,* beside; *peri,* around; *pro,* before; *pros,* in front of; *syn,* together, with.

XXIII. Plurals

Science students sometimes are perplexed as to the formation of the plurals of certain biological terms. Usually the addition of -s or -es suffices for familiar substantives, as well as for many technical terms. Many words, however, still remain under the influence of their classical origin, and for such it is considered proper to give the original inflections of their Greek or Latin prototypes, keeping in mind that most scientific words that were Greek at first are now used in Latinized form and usually conform to their foster declensions. Illustrations of the various declensions will help make clear the commoner plural formations.

1. First declension: Latin plural ending *-æ;* Greek plural ending *-ai.* alga, algæ; ameba, amebæ; antenna, antennæ; gemma, gemmæ: raphe, raphai; stele, stelai.

2. Second declension, masculine: Latin plural ending *-i;* Greek plural ending *-oi.* bacillus, bacilli; focus, foci; fungus, fungi; humerus, humeri: chondros, chrondoi; mesonephros, mesonephroi.

3. Second declension, neuter: Latin singular *-um,* plural ending *-a;* Greek singular *-on,* plural *-a.* bacterium, bacteria; datum, data; epithelium, epithelia; flagellum, flagella; vas, vasa (irregular, third declension for singular, but

second declension for plural): ganglion, ganglia; micron, micra.

4. Third declension: stems in *-i*, singular ending *-is*, not increasing in plural. apophysis, apophyses; axis, axes; Mantis, Mantes; pelvis, pelves; penis, penes.

5. Third declension: singular in *-is*, increasing in plural. aphis, aphides; chrysalis, chrysalides; proboscis, proboscides; rachis, rachides.

6. Third declension: singular in *-x*, increasing in plural. apex, apices; appendix, appendices; calyx, calices; cortex, cortices; helix, helices; index, indices; phalanx, phalanges; syrinx, syringes; thorax, thoraces.

7. Third declension: stem ending in liquid consonant. imago, imagines; umbo, umbones.

8. Third declension: Latin neuter, plural ending *-a*. cadaver, cadavera; corpus, corpora; lumen, lumina.

9. Third declension: Greek neuter, plural ending *-ata*. lemma, lemmata; stigma, stigmata; stoma, stomata.

10. Fourth declension: Latin, singular in *-us*, plural in *-ūs*. meatus, meatus; plexus, plexus; sinus, sinus.

11. Fifth declension: Latin, singular and plural in *-es*. series, series; species, species.

Although most technical biological terms should be treated with the respect due to age with regard to inflection as well as pronunciation, there are many instances where confusion as to the proper location of a word has led to the adoption of several forms of plurals. An extreme illustration of multiple plurals is shown by the word octopus. The oc′topus, or octo′pus, was named the eight-legged animal, in Greek ὀκτώ-πους, *oktōpous*, or ὀκτά-πους, *oktapous*. The Greek and Latin plurals would be octop′oda, but because of the wrong transfer of the third declension Latin *octōpus* to the second declension *octŏpus* a new plural was introduced, oc′topi. To these may be added the English plural oc′topuses, the taxonomic group names Octop′oda, Octopod′idæ and the erroneously formed Octo′pia, as well as the less formal oc′topods, octopo′dia and octop′odids. The animal has more aliases than it has "legs."

Some of the confusion in the formation of plurals arises

from the synonymous use of Latinized and Anglicized expressions. For example, pseudopodium and pseudopod are interchangeably used in the singular to designate an ameboid process. The plural of pseudopod is pseudopods, not pseudopodia, which is the plural of pseudopodium. Again, polyp and polypus have as plurals polyps and the mistakenly chosen polypi; the more correct form polypodes has been dropped.

Some common Anglo-Saxon names, instead of adding -s, form the so-called umlaut plurals. Reminiscent of the time when early English was an inflected language are such words as mouse, mice; louse, lice; man, men; foot, feet; goose, geese; tooth, teeth. Cow, Anglo-Saxon *ku,* had an early plural *ky* and a double plural *kyen,* the last persisting as kine. Mongoose, which is an East Indian name, has the plural mongooses; and cayman, a West Indian name, has caymans, not caymen. The Germanic plural ending -en is evident in ox, oxen, as well as in the recently borrowed terms anlage, anlagen; gebiete, gebieten.

In addition to the nouns of the fourth and fifth declensions, many common names of animals are the same in singular and plural, sometimes with an alternate plural ending -s or -es; *e.g.* deer, deer; vermin, vermin; buffalo, buffalo or buffalos; fish, fish or fishes. The tendency to intensify the plural signification, where one fish becomes several fish of a kind and several kinds of fishes, is likewise manifest in scientific terminology. It already has become correct to use the word pleura as singular of pleuræ as well as the plural form of pleuron. Exuvium, exuvia, exuviæ form another epistatic series; but the infra-singulars and super-plurals which follow, though sometimes used by the careless, are neologisms rejected by both science and etymology.

Singular culture-medium, plural culture-media, super-plural culture-medias

Singular cœcum, plural cœca, super-plural cœcæ

Singular datum, plural data, superplural datas

Singular flagellum, plural flagella, super-plural flagellæ

Infra-singular forcep, singular forceps, plural forceps

Infra-singular specie, singular species, plural species.

The plural of stamen is stamina, which is now used also

as a singular noun. The word peas or pease (from Latin *pisum*) was originally singular, but resembled a plural form so much that popular usage constructed a new singular, pea. Similarly, the early English name *grice* for a gray bird sponsored a new singular, grouse, before it became obsolete.

XXIV. The Greek Alphabet

For the convenience of those unfamiliar with Greek letters, the alphabet is here presented. It will be noted that many of the letters are similar to the corresponding English characters, so the mastery of the entire list should require but a few minutes of concentration. Every student of Biology ought to know the Greek letters as part of his working equipment. To assist in familiarizing him with dictionary Greek each occurrence of a Greek term in the glossary, Part II., has been printed twice, first in the original characters and then transliterated into italics.

Capital	*Small*	*Name*	*English equivalent*	*Capital*	*Small*	*Name*	*English equivalent*
Α	α	Alpha	a	Ν	ν	Nu	n
Β	β	Beta	b	Ξ	ξ	Xi	x
Γ	γ	Gamma	g*	Ο	ο	Omicron	o, short
Δ	δ	Delta	d	Π	π	Pi	p
Ε	ε	Epsilon	e, short	Ρ	ρ	Rho	r
Ζ	ζ	Zeta	z	Σ	σ, ς	Sigma	s
Η	η	Eta	e, long	Τ	τ	Tau	t
Θ	θ	Theta	th	Υ	υ	Upsilon	u, y
Ι	ι	Iota	i	Φ	φ	Phi	ph
Κ	κ	Kappa	k, c	Χ	χ	Chi	ch, like k
Λ	λ	Lambda	l	Ψ	ψ	Psi	ps
Μ	μ	Mu	m	Ω	ω	Omega	o, long

Initial vowels and rho are marked (ʽ) to indicate the sound of h; the mark (ʼ) indicates the normal smooth breathing.

*γγ, γξ, and γχ become ng, nx, and nch, respectively.

XXV. Derivations of Biological Terms

On the following pages are presented the stems of the commoner technical terms used in the various subdivisions of undergraduate Biology, mostly of foreign origin, as well as many familiar Anglo-Saxon words and names, for which the average student needs no dictionary definition. Also is included the etymology of the principal animals and plants likely to be encountered in laboratory courses, together with a listing of the sources of the commoner names of the biota of biological literature.

The term first given, in Roman type, represents usually the stem, though sometimes the entire word is given. This is followed by the original form of the word printed in italics. When the word is derived from the Greek the spelling and early accentuation are given in the original Greek characters preceding the italics form. There has been no attempt to trace the words beyond the Greek, although we realize that many terms entered the Greek language from Sanskrit, Persian, or other sources. The languages responsible for the various terms are indicated by prefixing a designating abbreviation, viz.: Am.Ind., North American Indian; Ar., Arabic; AS., Anglo-Saxon; Celt., Celtic; Corn., Cornish; D., Dutch; Dan., Danish; E.Ind., East Indian; Egypt., Egyptian; Fr., French; Gael., Gaelic.; Germ., Germanic (Teutonic) or German; Goth., Gothic; Gr., Greek; Heb., Hebrew; Hind., Hindu; Icel., Icelandic; It., Italian; L., Latin; LL., Late Latin; ME., Middle English; Norw., Norwegian; OF., Old French; OG., Old Germanic; Pers., Persian; Port., Portuguese; Skr., Sanskrit; Span., Spanish; Sw., Swedish; Teut., Teutonic, *i.e.* Germanic; Turk., Turkish; W., Welsh; W.Ind., West Indian.

After the classical names and their English equivalents there follow some representative biological terms, often analyzed into their literal components. The primary accentuation of these terms is indicated by dividing the words

immediately after the accented vowel, leaving the syllable open when the vowel is long and closing it by a consonant when the vowel is short. In some instances other vowels are marked with a macron (¯) or a breve (˘) to indicate the customary long or short sounds respectively.

A list of this sort can never be regarded as completed. Obviously all biological terms are not mentioned by name as illustrating the application of the stem sources, nor have there been included all the animals and plants, their parts and functions, nor all the descriptive terms which comprise the vocabulary of Biology. The enumeration has the advantage of bringing together from many sources the origins of the terms most likely to be encountered by undergraduate students. The list is not intended to serve as a glossary or dictionary, but instead is presented as an inspiration toward an appreciation of the foundations of biological terminology.

XXVI. Some Pertinent Definitions

LINGUISTICS, *lingua,* tongue, speech + *-ics,* suffix denoting science or art. The science of human speech; a study of the principles, derivation, properties and application of words.

PHILOLOGY, φιλολογία, *philologia,* fondness for words, discussion, learning and literature. The laws and principles of a given language or group of related languages.

GLOSSOLOGY, γλῶσσα, *glōssa,* tongue, language + -OLOGY, science < λέγο, *lego,* arrange. The classification of languages; also explanation of terms.

PHONOLOGY, φωνή, *phonē,* voice + -OLOGY. The science of the sounds of articulate speech as elements of language. Phonetics.

ONOMATOPOEIA, ὄνομα, *onoma,* name + ποιέω, *poieō,* make. Formation of words in imitation of natural sounds.

ORTHOEPY, ὀρθοέπεια, *orthoepeia,* correct language. The science of correct pronunciation.

ETYMOLOGY, ἐτυμολογία, *etymologia,* true derivation of a word. The history of words, dealing with derivation and structure of words and the changes undergone in passing from one language to another.

ORTHOGRAPHY, ὀρθός, *orthos,* correct + γραφή, *graphē,* writing. Science or art or method of correct spelling.

SEMASIOLOGY, σημασία, *sēmasia,* significance of a word. Science treating of the development or evolution of meanings of words. Semantics, σημαντικός, *sēmantikos,* significant meaning.

PEJORATION, *pejor,* worse, comparative of *malus,* bad. A change in the meaning of words in a disparaging direction, *e.g.* manœuvre > manure.

SYLLEPSIS, σύλληψις, *syllēpsis,* comprehension. Consideration of the sense rather than the literal import of words.

GRAMMATOLATRY, γράμμα, *gramma,* word + λατρεία, *latreia,* worship. Undue regard for the letter rather than the spirit of words.

NEOLOGY, νέος, *neos,* new + -OLOGY. The coining or using of new words or meanings.

AUXESIS, αὔξησις, *auxēsis,* increase. The use of a high-sounding expression in place of a simple word.

NOMENCLATURE, *nomenclātio,* calling by name (*nomenclātor,* a slave who announced for his master the names of persons he met). The systematic classification of technical names, or the naming of biological objects.

TERMINOLOGY, *terminus,* limit boundary, definition + -OLOGY (τέρμα, *terma,* goal, boundary mark; the turning post to be encircled for the return lap of a chariot race). The science or art dealing with the correct use of technical terms.

LUCUBRATION, *lucubrare,* to work by lamplight. Study or writing by artificial light, *i.e.* laboriously continued beyond daylight hours to result in pedantic over-elaboration of details.

PART II.

Alphabetical List of the Components of Biological Vocabulary

A

a, L. *a, ab, abs,* from, away, off. *a*sex'ual; *a*vert', off turn: *ab*or'al, opposite mouth; *ab*sorp'tion: *ab's*cess, off gone; *abs*tain', from hold; *ab's*tract, from drawn.
a, Gr. ἀ, *a* privative (ἀν- *an*-), not, without. *a*biogen'esis, without life produced; *a*chromat'ic, without color; *a*mito'sis: *an*om'alous; *An*u'ra, without tail (frogs).
abdom-, L. *abdōmen,* belly. abdo'men; abdom'inal.
acanth-, Gr. ἄκανθα, *akantha,* backbone, spine. Acanthoceph'ala.
acid, L. *aceo (acidus),* sour. ac'etose; acid'ify, acid make.
acar-, Gr. ἀ-καρής, *a-karēs,* too small to be cut, mite. Ac'arus; acar'icide, mite killer (L. *cædo,* kill); Acari'na (mites).
acetabulum, L. *acetabulum,* vinegar-cup.
achen-, Gr. ἀχαίνω, *achaino,* not gaping. a-kene'; ache'nium.
aciculum, L. *aciculum,* needle, prickle. acic'ular.
acin-, L. *acĭnus,* grape. ac'inose, like grape cluster.
Acipenser, L. *acipenser,* sturgeon.
acontium, Gr. ἀκόντιον, *akontion,* dart < ἀκή, *akē,* point. acon'tia (pl.).
acr-, Gr. ἄκρος, *akros,* tip. ac'rocyst; ac'rosome.
acrid-, Gr. ἀκρίς (ἀκριδ-), *akris (akrid-),* grasshopper. Acrid'ium.
act-, L. *actio (action-),* motion (< *ago,* set in motion < Gr. ἄγω, *agō,* lead). activa'tor.
actin-, Gr. ἀκτίς, *aktis,* ray, beam. actin'ic; actinomor'phic, ray shaped; Actinozo'a, rayed animals (Cœlenterata); Hexactinel'lida, six rayed (sponges).
acu-, L. *acus,* needle. acu'leate, stinging; acu'minate (L. *acūmen,* point); acute'.
ad, L. *ad,* to, toward, for, upon. Euphonically modified, *e.g.*:
ab-, *ab*bre'viate;
ac-, *ac*ces'sory or *ac*'cessory;

ad-, *ad*apta′tion; *ad*duct′or; *ad*re′nal; *ad*sorp′tion;
af-, *af*′ferent; *af*fi′nal; *af*fix′;
ag-, *ag*glu′tinate; *ag*gres′sive;
al-, *al*lu′vial;
an-, *an*nex′; *an*ni′hilate;
ap-, *ap*pend′age;
ar-, *ar*rest′;
as-, *as*simila′tion;
at-, *at*tach′ment; *at*tract′.

adder, AS. *a* + *nædre,* snake (> an adder).

ade-, Gr. ἅδην, *adēn,* enough. Adeph′aga, excess eater.

adel-, Gr. ἄδηλος, *adēlos,* unseen. Adēlochorda′ta.

adelph-, Gr. ἀδελφός, *adelphos,* brother < ἀ, *a,* together + δελφύς, *delphys,* uterus. monadel′phous, united stamens.

aden-, Gr. ἀδήν, *adēn,* gland. ad′enoid, gland like.

adipose, L. *adipōsus,* fatty < *adeps,* fat. ad′ipocere, fat-wax.

adult, L. *adolesco (adultus),* grow up (<*alo,* nourish). adoles′cent; ad-ult′.

æcia, Gr. αἰκίζω, *aikizō,* treat injuriously, plague. æcid′iospore, injuring spore.

ædeagus, Gr. αἰδοῖα, *aidoia,* genitalia. ædea′gus.

aer-, Gr. ἀήρ, *aēr,* air. a′erate; a′erobe, air living; a′erophyte, air plant; anaërob′ic.

æsthes-, Gr. αἴσθησις, *aisthēsis,* perception, sensation. anæsthe′sia, no sensation.

æstiv-, L. *æstas,* summer. æstiva′tion; æsti′val or es′tival (L. *æstīvus,* relating to summer).

agogue, Gr. ἀγωγή, *agōgē,* leading to or away. chlo′ragogue, green course; secre′togogue, secretion guide.

agon-, Gr. ἀγών, *agōn,* contest. antagonis′tic.

agr-, L. *ager (agri-),* Gr. ἀγρός, *agros,* field. agricul′ture; agron′omy, field management.

al, Ar. *al,* the. *al*′chemy; *al*′cohol (*al*+*koh′l,* paint); al′kali (*al*+*qalīy,* wood ashes); *a*′pricot (*al*+L. *præcox,* early ripe).

ala-, L. *āla,* wing. a′lar; a′late; al′ula, little wing.

alb-, L. *albus,* white. al′binism; albi′no; albinot′ic; albumen (L. *album ovi,* white of egg); albur′num (*i.e.* sapwood).

albatross, Port. *alcatroz,* pelican (<Port. *al,* the + *qādūs,*

bucket). (See p. 21.)

alder, AS. *alr* < L. *alnus,* alder.

aleurone, Gr. ἄλευρον, *aleuron,* wheat flour. aleu'rone.

alfalfa, Ar. *al,* the + *facfacah,* best fodder. alfalfa weevil.

alga, L. *alga,* seaweed. al'gæ (pl.); al'gal.

aliment-, L. *alimentum,* food (< *alo,* nourish). alimen'tary.

allant-, Gr. ἀλλᾶς, *allas,* sausage. allanto'ic; allan'tois, sausage like.

allelo-, Gr. ἀλλήλων, *allēlōn,* reciprocal. alle'lomorphs, reciprocal forms; par'allel.

allo-, Gr. ἄλλος, *allos,* another. allog'amy, cross marriage; Allolobroph'ora, other lobe bearing; allopol'yploid; allosynde'sis.

alter, L. *alter,* the other. alterna'tion (L. *alternus,* by turns).

altric-, L. *altrix (altric-),* nurse. altri'ces, nurse birds; altric'ial.

alve-, L. *alveus,* hollow, excavation. al'veolar; alve'olous, little cavity.

amb-, L. *ambi,* around, in two directions; *ambo,* both. Variously modified, *e.g.*:

- am-, *am*plex'us, folded around; *am*'putate, trim around;
- amb-, *am*'bient; *am*big'uous;
- ambi-, *ambi*dex'trous, right-handed on both sides;
- ambo-, *ambo*cep'tor, taking both;
- an-, *an*cip'ital, double headed.

amber, Ar. *amber,* fossil resin. am'bergris (Fr. *gris,* gray).

ambly-, amby-, Gr. ἀμβλύς, *amblys,* blunt; ἄμβων, *ambōn,* rim of a dish. Amblyp'oda, stump footed; Amblys'toma or Ambys'toma.

ambulacrum, L. *ambulacrum,* a walk shaded by trees, or a path bordered by flowers < *ambulare,* to walk. ambula'cral grooves.

ameba, amœba, Gr. ἀμοιβή, *amoibē,* change. ame'bocyte, changing cell; ame'boid.

ament, L. *āmentum,* thong, strap. am'ent; lig'ament, tying thong.

Amia, Gr. ἄμια, a kind of fish. A'mia.

ammo-, Gr. ἄμμος, *ammos,* sand. Ammocœ'tes (Gr. κοίτη, *koitē,* nest); Ammoph'ila.

ammon-, Egypt. *Ammon,* sun-god, having horns like a ram. am'monite (*i.e.* shaped like a ram's horn); ammo'nium (*i.e.* distilled from horn).

amnion, Gr. ἀμνίον, *amnion,* a bowl for catching blood of sacrificial victims. amniotic.

amph-, Gr. ἀμφί, *amphi,* on both sides, at each end, around; ἄμφω, *amphō,* both. amphias'ter; Amphib'ia, double life; amphimix'is; Amphiox'us, pointed at each end; am'-phipod; amphoter'ic (Gr. ἀμφότερος, *amphoteros,* comparative of *amphos,* both).

ampulla, L. *ampulla,* bottle, flask. ampul'læ (pl.).

amyl-, Gr. ἄμυλον, *amylon,* starch. amylolyt'ic, starch dissolving; amylop'sin, starch seasoner.

ana, Gr. ἀνά (ἀν-), *ana (an-),* up, through, again (opposed to *kata*). anab'olism, up throw, *i.e.* build; *ana*d'romous; *anal*'ogy; *an'*aphase; *anat*'omy, through cut; *an'*ode (Gr. *an* + ὁδός, *hodos,* way).

andr-, Gr. ἀνήρ (ἀνδρ-), *anēr (andr-),* man. andrœ'cium, male house; andropet'alous; gynan'dromorph, female male form; polyan'drous, many stamens.

anem-, Gr. ἄνεμος, *anemos,* wind. Anemo'ne (Gr. ἀνεμώνη, *anemōnē*), windflower, anem'one (common name); anemoph'ilous, wind loving; anemotax'is, wind orientation.

ang-, Gr. ἄγγος, *angos,* vessel. An'giosperm, encased seed; sporan'gium, spore case.

anim-, L. *anĭma,* wind, breath, life (see p. 10). an'imal (L. *animal,* living being); animal'cule (dim.).

ankle, AS. *ancleow,* ankle.

ankyl-, Gr. ἀνκυλός, *ankylos,* bent, crooked. ankylo'sis or ancylo'sis.

anlage, Germ. *anlage,* rudiment. an'lage, pl. an'lagen.

ann-, enn-, L. *annus,* year. an'nual; bien'nial; peren'nial.

annel-, L. *annellus, annŭlus,* a small ring. Annel'ida, segmented worms; an'nular; an'nulus.

Anopheles, Gr. ἀν, *an,* not + ὠφελής *ōphelēs,* of use (= hurtful). Ano'pheles or Anoph'eles (malaria mosquito).

ant, AS. *æmete,* emmet or ant.

ante, L. *ante,* before. *an'*cestor; *ante*bra'chium, fore arm;

*ante*ce'dent; *ante'*rior.

antelope, < Gr. ἄνθολοψ, *antholops,* bright eye.

antenna, L. *antenna,* sail-yard (<Gr. ἀνά, *ana,* forth + τείνω, *teinō,* stretch). anten'nal; anten'nule (dim.).

anth-, Gr. ἄνθος, *anthos,* flower, brightness. an'telope (Gr. ἄνθολοψ, *antholops,* bright eye); an'ther; antherid'ium; anthoph'ilous, flower loving; Anthozo'a, flower animals (sea anemones).

anthrop-, ἄνθρωπος, *anthrōpos,* man. an'thropoid, man like; anthropol'ogy, man study; Eoanthro'pus, dawn man; Pithecanthro'pus, ape man.

anti, Gr. ἀντί (ἀντ-) *anti (ant-),* in opposition to, against, opposite. *ant*arc'tic: *anti*en'zyme; *anti*p'odal, opposite foot; *anti*tox'in, against poison.

antrum, L. *antrum,* cavity (< Gr. ἄντρον, *antron,* cave).

anus, L. *anus,* fundament. a'nal; posta'nal tail.

aorta, Gr. ἀορτή, *aortē,* great artery (< ἀείρω, *aeirō,* lift). aor'tic.

ape, AS. *apa.*

apert-, L. *apertum,* open space (< *ad* + *pareo,* became visible). ap'erture.

aphis, Gr. ἀφειδής, *apheidēs,* lavish, bountiful. a'phis, pl. aph'ides.

api-, L. *ăpex (apicis),* summit. ap'ical; apic'ulate.

apis, L. *ăpis,* bee. a'piary, ap'iculture.

apple, AS. *æppel.*

apricot, < Port. *albricoque,* apricot (< *al* + L. *præcox,* early ripe). a'pricot.

apsid-, Gr. ἀψίς, *apsis,* or ἁψίς, *hapsis,* arch, loop, knot. anap'sid; diap'sis; parap'sidal grooves; synap'sis, together loop.

aqua-, L. *aqua,* water. aqua'rium; aquat'ic.

arach-, ἀράχνης, *arachnēs,* spider. Arach'nida, spider group.

araneus, L. *arāneus,* spider, cobweb. Ara'neæ (spiders).

arbor, L. *arbor,* tree. arbo'real; arbore'tum.

arbutus, L. *arbŭtus,* strawberry tree. Ar'butus, the tree; arbu'tus, the trailing vine.

arc-, L. *arca,* box, coffin. Arcel'la (dim.).

arc-, L. *arcus,* bow > Fr. *arche,* arc. ar'cuate; gill-arch; vis'ceral arch.

arch-, Gr. ἀρχαῖος, *archaios,* primitive, ancient < ἄρχω, *archō,* rule, be first. archæ′an; archæop′teryx, primitive flier; Archæozo′ic; archen′teron, primitive gut.

arct-, Gr. ἄρκτος, *arktos,* bear, north. arc′tic; antarc′tic.

area, L. *ārea,* open space. are′olar.

aren-, L. *arēna,* sand. arena′ceous; arenic′olous, sand dweller.

aril, LL. *arilli,* dried grapes. ar′il; ar′illate; ar′illode.

arista, L. *arista,* a bristly hair. aris′ta; aris′tate.

aristo-, Gr. ἄριστος, *aristos,* best. aristogen′esis.

arm, AS. *arm,* arm (< L. *armus,* arm, shoulder). ar′millate (L. *armilla,* bracelet).

arm-, L. *armo,* arm, equip. armadil′lo (Span. dim. of *armado,* armed); ar′mature; ar′mor; ar′my-worm.

arnica, ?<Gr. πταρμική, *ptarmikē,* sneezeweed.

arren-, Gr. ἄρρην, *arrēn,* male. arrenot′okous, male producing.

arter-, L. *artēria,* artery (< Gr. ἀρτηρία, *artēria,* windpipe). ar′tery.

arthr-, Gr. ἄρθρον, *arthron,* joint. Arthrop′oda, jointed legs.

arti-, Gr. ἄρτιος, *artios,* even. Artiodac′tyl, even toed.

artic-, L. *articulus,* small joint < *artus,* joint. Articula′ta, segmented; articula′tion.

Ascaris, Gr. ἄσκαρις, *askaris,* intestinal worm (<ἀσκός, *askos,* bag). As′caris.

ascus, Gr. ἀσκός, *askos,* bag. ascid′ian, little bag; Ascomyce′tes, bag fungi; as′con sponge; as′cospore; Exoas′cus, outside bag.

ash, AS. *æsc,* ash-tree.

Aspergillus, L. *aspergillus,* brush for sprinkling holy water (< *ad,* on + *spargo,* sprinkle). Aspergil′lus (bread mold).

Astacus, L. *astăcus,* crayfish; Gr. ἀστακός, *astakos,* lobster or crayfish.

aster, Gr. ἀστήρ, *astēr,* star. amphias′ter, both stars; Asteroi′dea, star like (starfish); as′tral.

atav-, L. *atăvus,* great-great-grandfather. atav′ic; at′avism; at′avus.

atmos-, Gr. ἀτμός, *atmos,* vapor. atmom′eter; at′mosphere; atmos′teon, air bone.

atrium, L. *atrium,* hallway, open court. a'tria (pl.); a'trio-pore, vestibule opening.

auric-, L. *auris,* ear. au'ricle, small ear; auric'ular; auricula'ria, like human ears.

austr-, L. *auster,* south. aus'tral; Australopithe'cus, southern ape.

aut-, Gr. αὐτός, *autos,* self. autog'amy, self fertilization; autol'ysis; au'tosome, self particle; autosynde'sis.

aux-, Gr. αὔξη, *auxē,* growth. aux'in; aux'ocyte, growing cell; aux'one (*i.e.* auxohormone); aux'ospore; auxo-sub'stance.

avis, L. *avis,* bird. A'ves, birds; a'vian; a'viary.

axil, L. *axis,* armpit. axil'la (dim.); ax'illary.

axis, L. *axis,* axis, axle. ax'ial; ax'il.

axon-, Gr. ἄξων, *axōn,* axis, axle. ax'one; axopo'dium; monax'on.

azalea, Gr. ἀζαλέος, *azaleos,* parched.

B

baboon, OF. *babuin.*

bacca, L. *bacca,* berry. bac'cate; bac'ciform.

bacil-, L. *baculum,* stick. Bacil'lus, little rod.

bact-, Gr. βακτήριον, *baktērion,* βάκτρον, *baktron,* stick. Bacte'rium; bacteriol'ogy.

badger, < Fr. *bladier,* grain stealer (< L. *ablatum,* grain).

balæn-, L. *balæna* (< Gr. φάλαινα, *phalaina*), whale. Balæn'idæ, whale family; baleen', whalebone.

balan-, Gr. βάλανος, *balănos,* acorn (<βάλλω, *ballō,* cast), *i.e.* dropped fruit. (Cf. gland.) Bal'anus (acorn barnacle); Balanoglos'sus, acorn proboscis.

balm, L. *balsămum,* aromatic ointment; Gr. βάλσαμον, *balsamon,* balsam-tree and its gum. bal'sam; embalm'.

bamboo, Malay *bambu.*

banana, S.Am. *banana.*

barb, L. *barba,* beard. barbed; bar'bellate; bar'bule.

bark, Sw. *bark,* rind.

barley, AS. *bærlic.*

bas-, Gr. βάσις, *basis,* pedestal. ba'sic; basid'ium, small pedestal; basid'iospore, stalked spore; Basidiomyce'tes, basidium fungi.

bass, AS. *bærs,* perch.

bast, AS. *bæst,* lime-tree. bast-fibres.

bat, ME. *bakke,* bat, *i.e.* flutterer.

bat-, Gr. βαίνω, *bainō,* walk, step. Hydrobat'idæ, water treaders; Hylob'ates, wood stepper (gibbon).

bathy-, Gr. βαθύς, *băthys,* deep. bathys'mal.

batrach-, Gr. βάτραχος, *batrachos,* frog. batra'chian.

bdell-, Gr. βδέλλα, *bdella,* leech. Bdellos'toma.

bean, AS. *beān.*

bear, AS. *beran.*

beast, L. *bestia.*

beaver, AS. *befer.*

bee, AS. *beō,* bee. bumble-bee (OG. *boom,* hum).

beech, AS. *bēce, bōc,* beech-tree (see book, p. 40). buckwheat (*i.e.* seeds like beech-nuts).

beet, AS. *bēte* < L. *bēta,* beet. sugarbeet.

beetle, AS. *bītel,* biter. potato beetle.

behave, be + have. beha'vior (<Fr. *avoir,* have); beha'viorism.

belly, AS. *belig,* bag, especially a skin bag. (Cognate with bag, bellows, bilge, billow, bolster, budget, bulge.)

belo-, Gr. βέλος, *belos,* a dart. Bel'odon, dart tooth; Belos'toma, dagger mouth.

benthos, Gr. βένθος, *benthos,* depth of the sea. ben'thon; benthon'ic.

berry, AS. *berige,* berry (but barberry < LL. *berberis*). raspberry (OF. *rasper,* scrape, *i.e.* stems with cutting thorns); strawberry (AS. *streāwian,* spread, *i.e.* propagate by runners, see p. 24).

bi-, bin-, L. *bis,* twice (=Gr. δι-, *di-*). *bi*lat'eral; *bi*'nary (L. *binārius,* by twos); *bi*nu'cleate, two nuclei; *bĭn*oc'ular, two eyed; *bi*'valve; *bi*v'ium, two roads.

bib-, L. *bibo,* drink. imbibition, in drinking.

bil-, L. *bīlis,* gall, bile, anger. bile-duct; bil'iary.

bi(o)-, Gr. βίος, *bios,* life. Amphib'ia, double life; biol'ogy,

life study; biom′etry, life measure; biot′ic; mi′crobe, minute life.

birch, AS. *beorc.*

bird, AS. *bridd,* bird (cognate with brood).

bison, Fr., L. *bison* < OG. *wisent* > AS. *wesend,* bison.

bladder, AS. *blædre,* blister (akin to blow). bladder-worm.

blade, AS. *blæd,* leaf.

blast-, βλάστη, *blastē,* primitive germ, bud. blas′tocœl, primitive cavity; blas′toderm; blas′topore, primitive opening; blas′tula, little germ; diploblas′tic, double germ layers; os′teoblast, bone bud.

blem-, Gr. βλῆμα, *blēma,* something thrown (cf. bol-) em′blem; prob′lem.

blephar-, Gr. βλεφαρίς, *blepharis,* eyelash. Blepharos′toma.

blood, AS. *blōd.*

boa, L. *boa* (?<L. *bōs,* ox, because of large size).

boar, AS. *bār.*

body, AS. *bodig.*

bol-, Gr. βάλλω, *ballō,* throw, put. Collem′bola, glue insertion; metab′olism, beyond put; sym′bol.

bomb-, L. *bombus,* Gr. βόμβος, *bombos,* buzzing sound. Bom′bus (bumble-bee).

bomb-, Gr. βόμβυξ, *bombyx,* silkworm. Bombyc′idæ, silkworm moth family.

bone, AS. *bān.*

boreas, Gr. βορέας, *boreas,* north wind. bo′real.

bosc-, Gr. βόσκω, *boskō,* graze. Proboscid′ia (elephants); probos′cis, front grazer.

bot, Gael. *boiteag,* maggot. blue bottle fly (*i.e.* little maggot blue fly).

botan-, Gr. βοτάνη, *botanē,* a vegetable, a plant to be eaten. bot′any.

botry-, Gr. βότρυς, *botrys,* grape-cluster. botryoi′dal tissue.

bov-, L. *bōs,* Gr. βοῦς, *bous,* ox. Booph′ilus (cattle tick); bovine. (See p. 18.)

bowel, L. *botulus,* sausage, intestine (*botellus,* dim.). botuli′nus.

brachi-, L. *brāchium,* Gr. βραχίων, *brachiōn,* arm. bra′chial; Brachiop′oda, arm footed.

brachy-, Gr. *βραχύς, brachys,* short, few. brachycephal'ic, short headed.
bracken, Sw. *bräken,* fern.
bract, L. *bractēa,* gold leaf. bract; brac'teal; brac'teate.
brady-, Gr. *βραδύς, bradys,* slow, heavy. Brad'ypus, slow foot (sloth).
brain, AS. *bregen.*
branch-, Gr. *βράγχια, branchia,* gills. bran'chiate; Branchios'-toma, gill mouth; Bran'chipus, gill leg; Lamellibran-chia'ta, leaf gill class (clams, etc.).
Brassica, L. *brassĭca,* cabbage.
breast, AS. *breōst.*
breed, AS. *brēdan,* beget < AS. *brōd,* brood. breeding; crossbred; inbreeding.
Bromus, L. *bromus,* oat; Gr. *βρῶμα, brōma,* food.
bronch-, Gr. *βρόγχος, bronchos,* windpipe. bron'chiole, small windpipe; bron'chus.
bront-, Gr. *βροντή, brontē,* thunder. Brontosau'rus, thunder reptile.
brow, AS. *brū.*
bryo-, Gr. *βρύον, bryon,* moss. Bryoph'yta, moss plants; Bry-ozo'a, moss animals.
bryo-, Gr. *βρύω, bryō,* teem with. em'bryo, in growing.
bucca, L. *bucca,* cheek. buc'cal.
bud, ME. *budde.* bud-mutation.
buffalo, L. *bubalus,* Gr. *βούβαλος, boubalos,* African gazelle <Gr. *βοῦς, bous,* bull; or Fr. *boeuf,* beef animal.
Bufo, L. *būfo (bufōn-),* toad.
bug, OE. *bug,* apparition; W. *bwg,* hobgoblin. (bugbear, OE., spectre in shape of bear.)
bulb, Gr. *βολβός, bolbos,* bulbous root. bulbif'erous.
bull, ME. *bule,* bull, *i.e.* bellower. bulldog; bullhead; bul-lock (dim.).
bulla, L. *bulla,* locket, blister, bubble. boil; bul'late; ebul-lit'ion.
buno-, Gr. *βουνός, bounos,* hill. bu'nodont, tuberculate mo-lar teeth.
bursa, L. *bursa,* pouch, sac. bur'sicle; purse.
butter, AS. *buttor* < L. *butyrum* < Gr. *βούτυρον, boutyron*

(βοῦς, *bous,* cow + τυρός, *tyros,* cheese). buttercup; butterfly (*i.e.* yellow fly); butyr′ic.

buzzard, OF. *busart* < L. *buteo,* buzzard.

byssus, Gr. βύσσος, *byssos,* fine yellowish flax. bys′sus.

byssus-, Gr. βυσσός, *byssos,* sea-bottom (<βαθύς, *bathys,* deep). abys′sal, without bottom.

C

cactus, < Gr. κάκτος, *kaktos,* a spiny plant (not the American cactus).

cad-, L. *cădo, (cāsum),* fall (cf. cid-). cadu′cous (L. *cadūcus,* falling); decay′.

caddis, ME. *cadas,* cloth shreds. cad′dis-fly or cad′dice-fly; caddis-worm. (Name indicating either the tubular case constructed by the worm, or the use of cloth shreds on fish-hooks as imitation caddis-flies.)

cæcum, L. *cæcum,* blind. pylor′ic cæ′ca (pl.).

cæspit-, L. *cæspes (cæspit-),* turf. cæs′pitose.

calamistrum, L. *calamistrum,* curling-iron.

calamus, Gr. κάλαμος, *kalamos,* reed.

calc-, L. *calx (calc-),* lime. Calca′rea, lime-spicule sponges; calcif′erous, lime bearing.

Calendula, <L. *calendæ,* calends, *i.e.* first day of month. Calen′dula (marigold, named for continuous blossoming).

calf, (1) AS. *cealf,* young cow, etc.; (2) ON. *kālfi,* calf of leg. calves (pl.).

call-, L. *callus,* hard skin. callos′ity.

calyptra, Gr. καλύπτρα, *kalyptra,* veil, hood. calyp′ter.

calyx, Gr. κάλυξ, *kalyx,* cup of a flower.

Cambarus, <L. *cammarus,* Gr. κάμμαρος, *kammaros,* lobster. Cam′barus (NL.), crayfish.

cambium, L. *cambium,* exchange.

Cambrian, <L. *Cambria,* Wales. Precam′brian.

camel, L. *camēlus,* Gr. κάμηλος, *kamēlos.*

camp-, Gr. κάμπη, *kampē,* caterpillar. Campo′dea, caterpillar form; Hippocam′pus.

campan-, L. *campana,* bell. Campanula′ria, little bell.

can-, L. *cănis,* dog. ca′nine.

can-, L. *cānus,* white. canes′cent (L. *canescens,* growing white).

canal-, L. *canālis,* channel. canalic′ulus, small tube.

cancel-, L. *cancello,* make like a lattice. cancel (see p. 20); can′cellate.

cane, L. *canna,* Gr. κάννα, *kanna,* reed.

capill-, L. *capillus* (<*capitis pilus,* hair of head), hair. cap′-illary.

capit-, L. *caput* (<Gr. κέφαλη, *kephalē*), head. bi′ceps, two heads; capit′ulum, little head; recapitula′tion, again heading; oc′ciput, back of head.

caps-, L. *capsa,* box, chest. cap′sule (dim).

carapace, Fr. *carapax,* L. *capara,* hood.

carb-, L. *carbo (carbon-),* a coal. carbohy′drate; carbon′ic; carbonif′erous; car′buncle (dim.).

carchar-, Gr. κάρχαρος,, *karcharos,* sharp-pointed, jagged. car-char′odont, jagged tooth.

carcin-, Gr. καρκίνος, *karkinos,* crab, cancer. Carci′nus (crab, see p. 20).

cardia, Gr. καρδία, *kardia,* heart. car′diac; pericar′dium, a-round heart.

Carex, L. *carex,* sedge (<Gr. κείρω, *keirō,* cut: *i.e.* shear-grass or sedge, *q.v.).*

carina, L. *carīna,* keel. Carina′tæ, birds with keeled sternum (cf. *Ratitæ).*

carn-, L. *caro (carn-),* flesh. carnas′sial (Fr. *carnassier,* flesh eater); Carniv′ora, flesh eater; car′rion; carna′tion. (Car′-nival, farewell to meat, *i.e.* originally a feast immediately before Lent.)

carotid, Gr. καρωτίς, *karōtis,* neck artery (<κάρος, *karos,* sleep, stupor). caro′tid (see p. 33).

carp-, Gr. καρπός, *karpos,* fruit. car′pel; car′pellate, fruiting; en′docarp; parthenocar′py.

carp-, Gr. καρπός, *karpos,* wrist. metacar′pal.

cartilage, L. *cartilago (cartilagin-),* gristle. cartilag′inous.

carunc-, L. *caruncula,* fleshy growth (<*caro,* flesh). car'uncle.

cary-, kary-, Gr. κάρυον, *karyon,* nut. caryokine'sis, nuclear movement; caryop'sis, nut appearance.

cat, LL. *cattus,* cat, *catulus,* young cat; Fr. *chat.* cat'amount, mountain cat; caterpillar (see p. 22); catnip (cat + L. *nepeta,* mint); wildcat.

cata-, Gr. κατά, *kata,* down, from side to side (opposed to ana-). *cata*b'olism (sometimes spelled *kata-*); *cat'a*lyst; *cat'a*rhine, low nose; *cat*h'ode, down way.

caten-, L. *catēna,* chain, link. catena'tion; caten'ulate.

caterpillar, OF. *chatepelose* (see p. 23).

cauda, L. *cauda,* tail. cau'dal; Cauda'ta, tailed (salamanders).

caul-, L. *caulis,* Gr. καυλός, *kaulos,* stalk. acaules'cent, not stalked; caul'iflower (from L. *caulis* with special meaning of cabbage); cau'line (Gr. καύλινος, *kaulinos,* growing on a stem).

cav-, L. *cavus,* hollow. cav'ity; con'cave; ex'cavate.

ced-, cess-, L. *cĕdo (cessum),* go. ab'scess; acces'sory; an'cestor (L. *ante,* before + *cedo*); reces'sive, back gone.

cell, L. *cella,* small room. cel'lular (dim.); cel'lulose.

ceno-, Gr. καινός, *kainos,* new. cenogen'esis, recent development; Cenozo'ic, recent animal life. (Also spelled kenogenesis, cænogenesis, etc.)

ceno-, Gr. κενός, *kenos,* void, empty. cen'osphere. (Cenotaph, Gr. τάφος, *taphos,* tomb.)

ceno-, Gr. κοινός, *koinos,* in common (see cœno-). ceno'bium; ce'nocyte or cœ'nocyte, joined cells; cenosarc or cœ'nosarc, joined protoplasm.

cent-, L. *centum,* hundred. cen'tigrade, hundred steps; cen'timeter (Gr. μέτρον, *metron,* measure); cen'tipede, hundred feet.

centr-, Gr. κέντρον, *kentron,* center. cen'triole (dim.); cen'trosome, central body; cen'trum.

cephal-, Gr. κεφαλή, *kephalē,* head. Cephalochor'da, head notochord (Amphioxus); Cephalop'oda, head footed (octopus); cephalotho'rax, head chest; enceph'alon, in head (brain).

cept-, L. *capio (cept-),* take. concep'tacle; concep'tion, together taking; percep'tion; receptac'ulum; recep'tion, with-holding; recep'tor, receiver.

cer-, Gr. κέρας, (κερατ-), *keras (kerat-),* horn. rhinoc'eros, nose horn; Tricer'atops, three horn face.

cer-, L. *cēra,* wax. ad'ipocere (L. *adeps,* fat).

cerc-, Gr. κέρκος, *kerkos,* tail. cerca'ria; cer'ci (pl.); cysticer'cus, bladder tail; heterocer'cal.

cerebrum, L. *cĕrĕbrum,* brain. cerebel'lum, little brain; cer'ebrum.

cervix, L. *cervix (cervic-),* neck. cer'vical.

Cervus, L. *cervus,* deer.

cess-, see *ced-.*

cest-, Gr. κεστός, *kestos,* girdle. Cesto'da, girdle-like (tapeworms).

cet-, Gr. κῆτος, *kētos,* whale. Ceta'cea, whales.

chæt-, Gr. χαίτη, *chaitē,* bristle, hair. Chætop'oda, bristle legged (Annelid worms); Oligochæ'ta, few bristles (earthworms).

chalaza, Gr. χάλαζα, *chalaza,* hailstone. chala'zæ (pl.).

chalc-, Gr. χαλκός, *chalkos,* copper. Chalcid'idæ, family of metallic Chalcis-flies.

chameleon, Gr. χαμαί, *chamai,* on the ground, or dwarf + λέων, *leōn,* lion.

chaparr-, Span. *chaparra,* live oak. chaparral' (dim.).

cheek, AS. *ceāce,* cheek.

chel-, Gr. χηλή, *chēlē,* claw, hoof. chelic'era, claw horn; chel'ifer, claw bearing (pseudoscorpion) ; chel'iped, claw leg.

chelys, L. *chelys,* Gr. χέλυς, *chelys;* χελώνη, *chelōnē,* tortoise. Chel'ydra (snapping turtle); Chelo'nia (turtles).

chem-, Gr. χημεία, *chēmeia,* chemistry. biochem'istry; chemotax'is, chemical order; chemorecep'tor.

cherry, ME. *chery,* Fr. *cerise,* L. *cĕrăsus,* cherry.

chest, AS. *cest,* thorax < L. *cista,* Gr. κίστη, *kistē,* box.

chestnut, OF. *chastaine* < L. *castanea,* chestnut.

chiasma, Gr. χιάζω, *chiazō,* mark crosswise like letter X, *chi.* chias'mata (pl.); chias'matype.

chicken, AS. *cicen,* dim. of *coc,* cock.

chil-, Gr. χεῖλος, *cheilos,* lip. Chilop'oda, lip legs (centipedes).

chimæra, Gr. χίμαιρα, *chimaira,* she-goat; the Chimæra.

chin, AS. *cin,* chin, originally cheek.

chinch-, Span. *chinche,* bedbug < L. *cimex,* bug, especially bedbug. chinchbug.

chir-, Gr. χείρ, *cheir,* hand, arm. Chirop'tera, hand winged (bats); surgeon (see p. 22).

chiton, Gr. χιτών, *chitōn,* coat of mail. chi'tin; Chi'ton (coat-of-mail mollusc).

chlamyd-, Gr. χλαμύς, *chlamys,* mantle. chlam'ydospore, thick wall spore.

chlor-, χλωρός, *chlōros,* green. chlo'rophyll, green leaf; Chlorophy'ceæ, green algæ; Zoochlorel'la.

choano-, Gr. χόανη, *choanē,* funnel. cho'anocyte, funnel cell; Choanoflagella'ta.

chol-, Gr. χολή, *cholē,* bile, gall. choles'terin (Gr. στερεός, *stereos,* solid); mel'ancholy, black bile.

chondr-, Gr. χόνδρος, *chondros* (1) granular; (2) cartilage. chondrocra'nium, cartilage skull; mitochon'dria, threads granular.

chor-, Gr. χῶρος, *chōros,* place, district. bi'ochore (χώρα, *chōra,* the space occupied by one); chorol'ogy, environment study.

chord-, Gr. χορδή, *chordē,* cord, string. Chorda'ta, notochord animals; Protochor'da, first cord.

chori-, Gr. χωρίς, *chōris,* separately. Choripet'alæ.

chorion, Gr. χόριον, *chorion,* membrane. cho'rion; chor'oid.

chromat, Gr. χρῶμα, (χρωματ-), *chrōma (chrōmat-),* color, surface. chro'matin; chro'matophore, pigment bearing; chromone'ma, color thread; chro'mosome, color body.

chron-, Gr. χρόνος, *chronos,* time. chron'ic; chronolog'ic; syn'chronous, timed together.

chrys-, Gr. χρυσός, *chrysos,* gold. chrys'alis (Gr. χρυσαλλίς, *chrysallis*); chrysan'themum, gold flower.

chthon-, Gr. χθών, *chthōn,* earth. autoch'thon, one born in the locality, *i.e.* an index species, not introduced.

chyle, Gr. χυλός, *chȳlos,* chyle, juice. chylif'erous (chyle + L. *fero,* produce).

chym-, Gr. χυμός, *chymos,* juice < χέω, *cheō,* pour. chyme; scleren'chyma, hard juice.

cicada, L. *cicāda,* (imitative). cicada-killer.

cicatrix, L. *cicātrix (cicātrīc-),* scar. cicatri′ces (pl.).
cid-, L. *cădo,* fall, *q.v.,* changed to *-cĭdo* in derivatives, decid′uous (L. *decĭdo*), down fall; oc′cident (<L. *occĭdo*), down falling, *i.e.* sunset > western.
cide-, L. *cædo (cæsum),* kill, cut down. fun′gicide, fungus killer; insec′ticide, insect killer.
cilium, L. *cilium,* eyelash. cil′ia (pl.), microscopic hair-like processes; Cilia′ta (Protozoa).
cin-, kin-, Gr. *κινέω, kineō,* move; *κίνημα, kınēma,* motion. cinen′chyma, sap tissue; kinet′ic.
cinclis, Gr. *κιγκλίς, kinklis,* latticed gate. cin′clides (pl.).
cinct-, cing-, L. *cingo (cinctum),* gird. cinc′ture; cin′gulum; succinct′ (see p. 10).
circ-, L. *circus,* circle. circular muscle; circula′tion (dim.).
circum, L. *circum,* around. *circum*am′bient, going around; *circum*œsopha′geal, around œsophagus; *circum*nuta′tion, around twining.
cirrus, L. *cirrus,* lock of hair. cir′ri (pl.); Cirripe′dia, fringe legged (barnacles).
cis-, L. *cædo (cæs-),* cut (see *cide-*). cir′cumcise; excis′ion; inci′sor, into cutter.
clad-, Gr. *κλάδος, klados,* branch, young shoot. Cladoc′era, branched antennæ (water fleas); Cladosel′ache, ancestral shark; pol′yclad, many branched intestine (fluke).
clam, AS. *clamm,* clamp.
class, L. *classis,* class, division < *calo,* Gr. *καλέω, kaleō,* summon. classifica′tion; sub′class.
clast-, Gr. *κλαστός, klastos,* broken < *κλάω, klaō,* break, prune. os′teoclast, bone breaker.
clav-, L. *clāvis,* key. au′toclave; clav′icle, little key.
clav-, L. *clāvus,* club. cla′vate, clav′iform, club shaped; clove.
claw, AS *clā.*
cleav-, AS. *cleōfan,* split. clea′vage; cleft.
cleisto-, Gr. *κλειστός, kleistos,* closed. cleistog′amy closed mating.
clim-, Gr. *κλίμα (κλιματ-), klıma (klimat-),* slope, region, climate: *κλῖμαξ, klimax,* ladder. accli′mate; cli′mate; cli′max.
clin-, Gr. *κλίνω, klīnō,* slope, lean, recline. cli′nostat, slope

instrument; in′cline; pericli′nal, winding around; pro′-clinate, leaning forward.
clitellum, L. *clitellum,* saddle.
clitoris, Gr. κλεῖτορις, *kleitoris,* latch < κλείω, *kleiō,* close. cli′toris.
cloaca, L. *cloāca,* sewer. cloa′cal.
clone, Gr. κλών, *klōn,* twig. clo′nal; Clonor′chis (fluke with branched testes).
clover, AS. *clæfre.*
clus-, L. *claudo (clus-),* close. inclu′sion, in closed.
clypeus, L. *clĭpĕus,* round shield. clyp′eal.
clys-, Gr. κλύζω, *klyzō,* wash over. cat′aclysm, *i.e.* deluge; clys′ium (plants on flooded areas).
cnem-, Gr. κνήμη, *knēmē,* lower leg. cne′mial; gastrocne′-mius, belly of leg.
cnid-, Gr. κνίδη, *knidē,* nettle. Cnida′ria, nettle animals; cni′doblast; cni′docil, stinging hair.
co-, see *cum.*
cob, ME. *coppe* or *cob,* spider. cob′web.
cobra, <L. *cŏlŭber,* snake.
coccus, Gr. κόκκος, *kokkos,* berry. Coc′cidæ (scale insects).
coccyg-, Gr. κόκκυξ, *kokkyx,* coccyx. coccyg′eal; coccy′ges (pl.).
cochl-, L. *cochlea,* snail; Gr. κόχλος, *kochlos,* spiral shell. coch′lear; cock′le.
cocoon, Fr. *cocon,* cocoon < *coque,* shell + *on,* dim.
cœl-, Gr. κοῖλος, *koilos,* hollow, cavity. Cœlentera′ta, hollow gut; cœ′liac (Gr. κοιλία, *koilia,* abdominal cavity); cœ′-lome, body cavity, pl. cœlom′ata.
cœn-, Gr. κοινός, *koinos,* shared in common (see *ceno-*). bi-ocœno′sis, life association; cœ′nosarc, common tissue.
coit- L. *coïtus,* union (*co,* together + *itus,* go). coi′tion.
col-, L. *cŏlo (cultum),* cultivate, dwell. arenic′olous, sand dwelling; col′ony (L. *colōnia,* colony, farm); cul′ture.
coleo-, Gr. κολεός, *koleos,* sheath. Coleop′tera, sheath wings (beetles); coleorhi′za, sheath root.
coll-, Gr. κόλλα, *kolla,* glue. collen′chyma, glue infusion; col′loid, glue like.
colon, Gr. κόλον, *kolon,* large intestine. col′ic.
color, L. *color,* tint.

colum-, L. *colŭmen, columna,* column. columel'la (dim.).
columb-, L. *columba,* dove; *columbus,* male pigeon. col'umbine (L. *columbīnus,* pertaining to a pigeon).
conch-, L. *concha,* Gr. κόγχη, *konchē,* shell (cf. *cochl-*). conchol'ogy.
condyle, Gr. κόνδυλος, *kondylos,* knuckle. con'dylar.
cone, L. *cōnus,* Gr. κῶνος, *kōnos,* pine-cone. co'nifer, cone bearer; Cōnif'eræ; co'niform.
conid-, Gr. κόνις, *konis,* dust. conid'iospore; conid'ium.
contra, L. *contra, counter-,* against. *contra*ctil'ity; *counter*-act.
cope-, Gr. κώπη, *kōpē,* oar. Copep'oda, oar footed.
copro-, Gr. κόπρος, *kopros,* dung. cop'rolite, dung petrifaction; coproph'agous, dung eater.
copul-, L. *copula,* link, connection. copula'tion.
cor-, cord-, L. *cor (cord-),* heart. cor'date; cor'dial; core.
corac-, Gr. κόραξ (κορακ-), *korax (korak-),* crow. cor'acoid, crow's beak like (see p. 14).
coral, Gr. κοράλλιον, *korallion.*
corb-, L. *corbis,* basket. cor'bel; corbic'ula (LL. dim.).
corium, L. *corium,* leather. coria'ceous.
corm-, Gr. κορμός, *kormos,* tree-trunk. corm; cor'mus.
corn, AS. *corn,* a grain. kernel (dim.). (In America the name corn has been transferred to maize, a plant unknown to early Europeans. Acorn is not oak-corn, but AS. *æcern,* a kind of fruit.)
corn-, L. *corneus,* horny; *cornu,* horn. cor'nea; cor'neous; cor'nicle; u'nicorn.
corolla, L. *corolla,* dim. of *corōna,* wreath, garland.
corona, L. *corōna,* Gr. κορωνίς, *korōnis,* wreath, garland. cor'onary; cor'onoid; crown. (See p. 14.)
corp-, L. *corpus (corpor-),* body. corpse; cor'puscle, small body; incor'porate.
cort-, L. *cortex (cortic-),* bark. cork; cor'tical, of bark; cor'tices (pl.).
corvus, L. *corvus,* crow. cor'vine; cor'morant (LL. *corvus marīnus,* sea raven).
corymb, Gr. κόρυμβος, *korymbos,* summit, cluster of flowers. corym'bose; corym'bus.

cosmo-, Gr. κόσμος, *kosmos,* world, universe. cosmopol'itan, world citizen; mac'rocosm.

costa, L. *costa,* rib. cos'tate; cos'tiform; intercos'tal, between ribs.

cotton, Fr., Span. *coton,* Ar. *gatun.*

cotyl-, Gr. κοτύλη, *kotylē,* cup, socket. cot'yloid.

cotyledon, Gr. κοτυληδών, *kotylēdōn,* cup-like hollow, socket. monocotyle'don; polycotyle'donous.

coxa, L. *coxa,* hip. cox'al; coxop'odite.

crab, AS. *crabba* (see Chart III., p. 20).

crane, AS. *cran.* cran'berry, crane berry. (Cf. geranium.)

cranium, Gr. κρανίον, *krānion,* skull. Crania'ta.

crasped-, Gr. κράσπεδον, *kraspedon,* border, fringe. Acras'pedote medu'sa.

Cratægus, LL. *cratægus,* hawthorn < Gr. κράτος, *kratos,* strength, *i.e.* strong wood.

creat-, L. *creo (creat-),* make of nothing. crea'tion; crea'ture; pro'create.

cremaster, Gr. κρεμαστήρ, *kremastēr,* hanger.

cren-, L. *crēna,* notch. cre'nate; cren'ulate.

creo-, Gr. κρέας, *kreas,* flesh, meat. Creodon'tia.

crepus-, L. *crĕper,* dark; *crepusculum,* twilight. crepus'cular.

cresc-, L. *cresco,* grow. concres'cence; decrease; excres'cence, out growth.

cret-, L. *cerno (crētum),* separate. ex'crement; excre'tory, out separate; secre'tory, apart separate.

creta, L. *crēta,* chalk. Creta'ceous.

cribr-, L. *crībrum,* sieve. crībel'lum, little sieve; cri'briform.

cricket, OF. *criquet* (imitative). mole-cricket.

crin-, Gr. κρίνον, *krinon,* lily. Crinoi'dea, lily like (sea lilies).

crin-, Gr. κρίνω, *krinō,* separate. en'docrine, within separating.

cris-, crit-, Gr. κρίσις, *krisis,* deciding point; κρίτης, *kritēs,* judge < κρίνω, *krinō,* separate. cri'sis; crit'ical; critique' (<Fr.).

crocodil-, Gr. κροκόδειλος, *krokodeilos,* crocodile. Crocodil'ia.

cross-, Gr. κροσσοὶ, *krossoi,* fringe. Crossopteryg'ia, fringe finned (Ganoid fish).

crotal-, Gr. κρόταλον, *krotălon,* rattle. Crot′alus, rattlesnake.
crust-, L. *crusta,* crust. Crusta′cea, shelled animals; incrusta′-tion.
crypt-, Gr. κρύπτω, *kryptō,* hide. Cryptobran′chus, hidden gills; Cryp′togam, concealed mating.
cten-, Gr. κτείς (κτεν-), *kteis (kten-),* comb. ctenid′ium (dim.); cten′oid, comb like; Ctenoph′ora, comb bearers.
cub-, L. *cubo (cubĭtus),* lie down, bend elbow. cubita′lis (L. *cubĭtum,* elbow); cu′bitus, bent vein; in′cubate, on lying.
cub-, Gr. κύβος, *kubos,* cube. cubical; cubiform; cuboid.
cuckoo, L. *cucūlus,* cuckoo (imitative).
cucum-, L. *cucŭmis,* cucumber. (Cf. *cucuma,* kettle<*coquo, coctum,* to prepare food, cook, ripen.)
culex, L. *cŭlex,* gnat. Cu′lex, mosquito; Culic′idæ.
culm, L. *culmus,* stalk; cf. Gr. κάλαμος, *kalamos,* reed. culm.
cum, L. *cum,* together, with. Modified when used as prefix, *e.g.*:
- co-, *co*ag′ulate; *co*he′sion; *co*ordina′tion;
- cog-, *co*′gent; *cog*′nate; *cog*ni′tion;
- col-, *col*lat′eral; *col*lect′;
- com-, *com*bine′; *com*men′sal; *com*′missure; *com*plete′; *com*pos′it; *com*pound;
- con-, *con*juga′tion; *con*juncti′va; *con*nec′tive; *con*trac′tile;
- cor-, *cor*rect′; *cor*rode′; *cor*rupt′.

cumb-, L. *cubo (cubĭt-),* recline (with prefix > *-cumbo* [*-cubit-*]). incum′bent; procum′bent.
cune-, L. *cunĕus,* wedge. cu′neate; cune′iform, wedge shape.
cup-, L. *cūpa,* tub, cup. cu′pule (dim.).
curculio, L. *curculio,* weevil.
currant, <Gr. Κόρινθος, *Korinthos,* Corinth, *i.e.* original source of plant.
curs-, L. *curro (cursum),* run. curso′rial, fitted for running; decur′rent; excur′rent, passing out; excur′sion; incur′-rent, in flowing.
cusp, L. *cuspis,* point. bicus′pid, double pointed; cus′pidate.
cutis, L. *cŭtis,* skin. cuta′neous; cu′ticle (dim.); cu′tin.
cuttlefish, ME. *cotul,* bag + fish; or possibly cuddle fish.
cyan-, Gr. κύανος, *kyanos,* dark blue. Cyanophy′ceæ, blue

algæ; hæmocy'anin, blue blood.

cycad, Gr. κύκας (κυκαδ-), *kykas (kykad-),* cocoa palm. Cy'cas.

cycl-, Gr. κύκλος, *kyklos,* round. biocy'cle, life surroundings; cy'cloid, circular; Cy'clops, pl. cy'clopes, round eye; cyclo'sis; Cyclostom'ata, round mouthed (lampreys).

cym-, Gr. κῦμα, *kyma,* something swollen. cyme.

cyn-, Gr. κύων, *kyōn,* dog. cy'nodont, dog tooth. (See cynosure, p. 10.)

cypris, Gr. Κύπρις, *Kypris,* Cypris, the Venus of Cyprus island. Cypripe'dium (for Gr. πέδιλον, *pedīlon,* slipper), lady's slipper; Cy'pris.

cyps-, Gr. κυψέλη, *kypselē,* box. cyp'sela.

cyst, Gr. κύστις, *kystis,* bladder, bag, pouch. Cysticer'cus, bladder tail (stage of tapeworm); encyst'; nem'atocyst, thread bag.

cyt-, Gr. κύτος, *kytos,* hollow place. cytol'ogy, cell study; cy'toplasm, cell stuff; cy'tosome, cell body; leu'cocyte, white cell; phag'ocyte, devouring cell.

D

dactyl-, Gr. δάκτυλος, *daktȳlos,* finger, toe. dactylozo'oid, finger animal; Artiodac'tyl, even toed; date-palm; pentadac'tyl, five fingered; Perissodac'tyl, odd toed; Pterodac'tyl, wing fingered.

-dæum, Gr. δαίω, *daiō,* divide. proctodæ'um, anal division; stomodæ'um, mouth division.

daisy, AS. *dægeseage,* day's eye, *i.e.* sun.

dat-, L. *do (datum),* give, offer. da'tum, pl. da'ta (L. *datum,* a thing given); date.

Datura, Ar. *tatorah,* the stramonium plant.

de, L. *dē,* down, from, off. *de*cay' (down + *cado,* fall), *de*cid'ua; *de*feca'tion; *de*lamina'tion; *de*le'tion; *de*volu'tion.

death, AS. *death,* Goth. *dauthus,* death.

deca-, Gr. δέκα, *deka,* ten. decan'drous, ten stamens; dec'-

apod, ten footed.

decuss-, L. *decusso,* divide crosswise, like X (cf. *chiasma*). decussa'tion.

deer, AS. *deor,* Germ. *thier,* L. *fera,* Gr. θήρ, *thēr,* game animal. reindeer (AS. *hran,* deer + *deor,* wild animal).

del-, Gr. δῆλος, *dēlos,* manifest, visible. Adēlochor'da; Urode'la, tail manifest (salamanders).

delph-, Gr. δελφύς, *delphys,* uterus. (See dolphin.) Didel'phys, two vaginas (opossum).

dem-, Gr. δέμας, *demas,* body. ap'odeme, off body.

dem-, Gr. δῆμος, *dēmos,* people. endem'ic (etymologically ende'mic), in the population; epidem'ic.

dendr-, Gr. δένδρον, *dendron,* tree. den'drite, branching; den'drolite; dendrol'ogy, tree study.

dent-, L. *dens (dent-),* tooth. dandelion (Fr. *dents de lion,* teeth of lion); den'tary; dentic'ulate; den'tine; Edenta'ta, without teeth (ant eaters).

derma-, Gr. δέρμα (δερματ-), *derma (dermat-),* skin. der'mal; der'mis; ec'toderm, outside skin; epider'mis, over skin; hypoder'mis, under skin; pach'yderm, thick skin.

des-, Gr. δῆσε, *dēse,* binding < δέω, *deō,* bind. synde'sis, together bound.

desm-, Gr. δεσμός, *desmos,* ligament, fetter. des'mid, bound; Desmospon'giæ, ligamentous sponges.

deut-, Gr. δεύτερος, *deuteros,* second. deutocer'ebrum, second brain; deu'toplasm, secondary formation.

Devon-, <Devon, or Devonshire, England. Devo'nian.

di, Gr. δίς, *dis,* two, double (=L. *bi-*). dicotyle'donous, with two cotyledons; dimor'phism, two forms; diœ'cious, two housed; dip'loid, double; Dip'tera, two winged (flies).

dia, Gr. διά, *dia,* through, across (=L. *dis-*). *dia*be'tes; *dial'*ysis, apart loose; *di'a*phragm, through enclose; *di'a*tom, through cut; *di*elec'tric.

dich-, Gr. δίχα, *dicha,* asunder. dichot'omy, asunder cut.

dictyo-, Gr. δίκτυον, *diktyon,* net. dic'tyosome, net body; Palæodictyop'tera, ancient net winged.

didym-, Gr. δίδυμος, *didymos,* in pairs. did'ymous, double; epidid'ymis, upon testicle.

diet, Gr. δίαιτα, *diaita,* mode of life, regimen. di'et; di'etary.

digit-, L. *digitus,* finger. dig'itate; dig'itigrade, toe walker.

dīn-, Gr. δεινός, *deinos,* terrible. Dīnothe'rium; Dīnosau'ria, terrible lizards (dinosaurs).

dĭn-, Gr. δίνη, *dinē,* a whirling. Dĭno'bryon, whirling moss; Dĭnoflagella'ta; Peridin'ium, around whirling.

diphy-, Gr. διφυής, *diphyēs,* double (δίς, *dis,* two + φυή, *phyē* nature, stature). diphycer'cal, double tail; diph'yodont, double teeth.

diplo-, Gr. διπλόος, *diploos,* double. (Cf. diploma, folded document, see p. 41.) diploblas'tic, double germ-layer; Diplod'ocus (Gr. δοκός, *dokos,* beam, bar, shaft); dip'loid; Diplop'oda, double legged (millipeds); Diplozo'on.

dis, L. *dis,* asunder, apart. Modified as follows:

- di-, *di*gest; *di*late; *di*rec'tion;
- dif-, *dif*'fer; *dif*fu'sion;
- dis-, *dis*artic'ulate; *dis*embow'el; *dis*junc'tion; *dis*perse'; *dis*sect'.

dis, L. *dis,* not. *dis*par'ity; *dis*sim'ilar.

disc, Gr. δίσκος, *diskos,* quoit. discoi'dal; disk (akin to dish).

distal, L. *disto,* stand apart + suffix *-al* (opp. proximal). dis'tad; dis'tant.

distinct-, L. *distinguo (distinct-),* separate. distin'guish.

diurn-, L. *diurnus,* for a day (<*dies,* day). di'al (L. *dialis,* daily); diur'nal.

div-, L. *dīvĭdo (divīsum),* divide (*dis,* apart + *vid-,* separate). divis'ion; individ'ual, not divided.

dog, AS. *docga.*

dolich-, Gr. δολιχός, *dolichos,* long. dolichocephal'ic, long skull; Dolichoglos'sus, long tongue.

dolphin, L. *delphinus,* Gr. δελφίν, *delphin,* lit. belly-fish (Gr. δελφύς, *delphys,* uterus, *q.v.).* Delphin'ium, *i.e.* flower dolphin-shaped.

dom-, L. *domus,* Gr. δόμος, *domos,* house. domestica'tion.

dominat-, L. *dominor,* rule. dom'inance.

donkey, O.E. *dun,* brown (*i.e.* horse) + *k* + *ey* (double dim.).

dor-, Gr. δῶρον, *dōron,* giver. Eudori'na, good giver; Pandori'na, all giver.

dorm-, L. *dormio,* sleep. dor'mancy; dor'mant.

dorsum, L. *dorsum,* back (opp. ventral). dor′sad, back toward; dor′sal.

dos-, dot-, Gr. δόσις, *dosis,* a giving. an′tidote, opposing gift; dose. (Mem. an′ec-dote, not given out, *i.e.* secret.)

dove, AS. *dūfe,* dove (<AS. *dūfan,* dive).

dragon, L. *draco,* Gr. δράκων, *drakōn,* dragon, *i.e.* sharp sighted (Gr. δέρκομαι, *derkomai,* to look at). drag′onfly; snap-dragon.

drom-, Gr. δρομεύς, *dromeus,* runner. anad′romous, ascending; drom′edary.

drone, AS. *dran,* Gr. θρώναξ, *thrōnax,* drone-bee.

dros-, Gr. δρόσος, *drosos,* dew. Dros′era, sundew; Drosoph′ila, dew lover.

drup-, L. *drupa,* Gr. δρύππα, *druppa,* over-ripe olive. drupa′ceous; drupe, soft stone-fruit.

duck, ME. *duke,* duck, diver (<ME. *duken,* dive). duck′ling, duck + double dim. *-l* and *-ing.*

duct-, L. *duco (ductus),* lead. adduc′tor, toward leader; ductless; o′viduct, egg leader; produce′, lead forth; reduc′tion; reproduc′tion.

duo, dyad, L. *duo,* Gr. δύο, *dyo,* two. doub′le; du′al; duode′num <L. *duodecim,* twelve (fingerbreadths); du′plicate, two fold; dy′ad.

dur-, L. *dūrus,* hard. durable; *du′ra ma′ter,* hard matrix; du′ramen (heartwood); in′durate; endure′.

dyn-, Gr. δύναμις, *dynamis,* power, strength. dynam′ic; dy′nasty; dyne.

dys-, Gr. δυς-, *dys-,* insepar. prefix, opp. to *eu-,* indicating weakness, bad. dys′entery, bad bowels; dysgen′ic, bad birth; dysmeris′tic, weak segments; dyspep′sy, weak digestion.

dyt-, Gr. δύω, *duō,* enter, dive. Dytis′cus, diver; trog′lodyte, cave enterer.

E

e, L. *ex* (*e-* before consonants), out (see *ex-*). *E*denta'ta, without teeth; *e*ges'tion; *e*mo'tion; *e*ner'vate or *en*'ervate; *e*vis'cerate, out entrails.

eagle, L. *aquĭla,* eagle (<L. *aquĭlus,* brown).

ear, AS. *eāre,* <L. *auris,* ear. ear'wig (AS. *eor-wicga,* ear wiggler).

earth, AS. *eorthe,* earth. earth'worm.

ec-, Gr. ἐκ, *ek* (before consonant), out of, from. *ec*'dysis, out slipping. (See *ex-*, *ect-*.)

echin-, Gr. ἐχῖνος, *echinos,* spiny, hedgehog (cf. *urchin*). Echinoder'mata, spiny skinned; Echinoi'dea, hedgehog like (sea urchins).

eclos-, <L. *ex,* out + *claudo,* shut. eclo'sion.

eco-, See *œc-*.

ect-, Gr. ἐκτός, *ektos,* outside. ec'toderm, outside skin; ec'toplasm; ec'tosarc, outside flesh.

edaph-, Gr. ἔδαφος, *edaphos,* ground, bottom. edaph'ic, pertaining to soil.

eel, AS. *æl,* Aryan *agh-la,* L. *anguilla,* eel (<L. *anguis,* snake). el'ver, little eel.

ef-, See *ex.*

egg, AS. *æg,* egg.

elas-, elat-, Gr. ἐλαύνω, *elaunō,* drive, stretch. elas'tic; el'ater (Gr. ἐλατήρ, *elatēr,* a driver).

elasm-, Gr. ἔλασμα, *elasma,* plate. Elasmobran'chia, plate gills (sharks).

elbow, AS. *elboga,* elbow.

electro-, Gr. ἤλεκτρον, *ēlektron,* amber. bioelec'tric; elec'trode; elec'tron.

element, L. *elementum,* first principle, rudiment. elemen'tary.

elephant, Gr. ἐλέφας, *elephas,* elephant (<Heb. *eleph,* ox). elephanti'asis.

eleuther-, Gr. ἐλεύθερος, *eleutheros,* free, unattached. Eleutherozo'a.

elk, =Germ. *elch* < L. *alces,* elk (<Gr. ἀλκή, *alkē,* bodily strength).

elm, AS. *elm* < L. *ulmus,* elm.

Elodea, Gr. ἕλος, *helos,* marsh + εἶδος, *eidos,* form. Elode'a; elo'des.

elytr-, Gr. ἔλυτρον, *elytron,* covering. el'ytra, wing covers.

embryo, Gr. ἔμβρυον, *embryon,* embryo, fœtus (ἐν, *en,* in + βρύω, *bryō,* teem). embryol'ogy, fœtus study.

en-, em-, Gr. ἐν, *en,* on, at, in, near. *em*'bryo; *en*cyst'; *en*'ergy; *en*'zyme, in ferment.

enamel, L. *smaltum,* enamel.

end-, ent-, Gr. ἔνδον, *endon-,* ἐντός, *entos,* within. *en'do*crine *en'do*derm or *en'to*derm, within skin; *endo*g'amy; *en-do*mix'is; *endo*par'asite; *endo*p'odite; *endo*smo'sis, inward pushing; *en'do*sperm, internal germ; *en'do*style; *Ent*ame'ba, inside ameba.

enn-, See *ann-.*

ensi-, L. *ensis,* sword. en'siform.

enter-, Gr. ἔντερον, *enteron,* gut. Cœlentera'ta, hollow gut; Enteropneus'ta, intestine breathing.

entom-, Gr. ἔντομον, *entomon,* insect (ἐν, *en* + τέμνω, *temnō,* cut). entomol'ogy, insect study; entomoph'ilous, insect liking (flowers); Entomos'traca, insect-like crustaceans.

environ-, Fr. *environ,* around. envi'ronment.

eo-, Gr. ἠώς, *ēōs,* dawn. E'ocene, dawn of recent time; Eohip'pus, Eocene horse; e'olith, earliest stone implement.

eon, Gr. αἰών, *aiōn,* age. æon or eon.

Ephemera, Gr. ἐφήμερος, *ephēmeros,* living but a day (dayfly).

ephyra, Gr. Ἐφύρα, *Ephyra,* Ephyra, a sea nymph. eph'yra.

epi, Gr. ἐπί, *epi,* sometimes *ep-,* upon, beside, over.

ep-, *ep*ac'me, next to the top; *ep*edaph'ic, over ground; *ep*he'bic (Gr. ἥβη, *hēbē,* youth).

epi-, *epi*b'ole; *epi*der'mis, upon skin; *epi*did'ymis, upon testicle; *epi*glot'tis, over windpipe; *epi*ph'ysis, over growth; *epi*the'lium, on nipple.

equ-, L. *æquus,* equal. equato'rial, making equal (hemi-

spheres); equilib'rium (L. *libra,* balance); equiv'alent (L. *valens,* strong); e'ven.

equ-, L. *equus,* horse. equip'; Equise'tum, horse tail; eq'uitant, astride; E'quus, horse genus.

erem-, Gr. ἐρῆμος, *erēmos,* desert, solitude. ere'mian; ere'mic, pertaining to the desert. (Cf. *hermit.)*

erg-, org-, urg-, Gr. ἔργον, *ergon,* work. en'ergy; ergat'ogyne, worker female; or'gan *(q.v.);* sur'gery (contr. of chiurgery, hand work, see p. 22); syner'gids, coworkers. (ar'gon, an inert gas = ἀ, not + ἔργον.)

ergot, Fr. *ergot,* ergot, spur.

err-, L. *erro,* wander. aberra'tion; errat'ic; er'ror.

eruc-, L. *erūca,* caterpillar. eru'ciform.

eryth-, Gr. ἐρυθρός, *erythros,* red. eryth'rocyte, red cell.

eth-, Gr. αἰθήρ, *aithēr,* heavens < αἴθω, *aithō,* kindle. e'ther; eth'yl; Ethio'pian, burnt face.

eth-, Gr. ἔθος, *ethos,* custom, habit. eth'ics; ethol'ogy, behavior study.

ethm-, Gr. ἠθμός, *ēthmos,* strainer. eth'moid, sieve-like.

ethn-, Gr. ἔθνος, *ethnos,* race, tribe, people. eth'nic; ethnol'ogy, race study.

etiolat-, Fr. *etioler,* blanch < Fr. *esteuble,* stubble < L. *stipulæ,* straw. etiola'tion.

-etum, L. *-etum,* suffix denoting a collection of plants. arbore'tum; pine'tum.

eu-, Gr. εὖ, *eu,* well. eugen'ics, well born; Euthe'ria, fine beasts; eutroph'ic, good nutrition; eutro'pic, good turning.

eury-, Gr. εὐρύ, *eury,* widely, far reaching. euryha'line; euryph'agous, omnivorous; euryther'mal, of wide temperature range.

Eustachian, <*Eustachio,* Italian anatomist (1524-1574) (ch as if k).

euthenic, Gr. εὐθηνέω, *euthēneō,* be well off. euthen'ics.

ev-, L. *evum* or *ævum,* age, life, time, eternity < Gr. αἰών, *aiōn,* age. coe'val; e'on; ev'er; longev'ity (L. *longævus,* aged < *longus,* long + *ævum*).

ex, L. *ex (ef-),* Gr. ἐξ, *ex,* out, out of, off, away *(e-, ec-,* before some consonants, *q.v.).* Variants:

ef-, *ef*′fect; *ef*′ferent, carrying away; *ef*fic′ient;

ex-, (L.) *exact*′, (*exigo, exactus*), drive out; *ex*cre′tion; *ex*pec′torate; *ex*ter′minate; *ex*ude′ (*ex* + *sudo,* sweat); *ex*umbrel′la; *ex*u′viæ (*exuo,* strip off);

ex-, (Gr.) *ex*osmo′sis, out pushing; *ex*ot′ic (ἐξωτικός, *exōtikos);*

iss-, *iss*ue (Fr. *issu* < L. *exeo* [*exitus*], go out, cf. exit).

exo, Gr. ἔξω, *exō,* outside (opp. endo-). *exo*g′amy, outside mating; *exo*g′enous; *ex*′*o*plasm; *exo*p′odite, outer foot-part; *exo*skel′eton.

extra, L. *extra, exter,* beyond, outside. *extra*cel′lular; *extra*v′asate, outside the vein; *exte*′rior (comp. of *exter*); *extr*in′sic (L. *extrinsĕcus,* on the outside < *extra* + *secus,* beside); *ex*′*tr*orse (*extra* + *versus,* turned).

eye, AS. *eāge,* pl. *eāgan,* eye.

F

fac-, L. *facio (factum),* make, do, cause, give. artific′ial, skilfully made; classifica′tion, division making; defic′iency; fact; fac′tor; mag′nify; olfac′tory (*oleum,* smell); ossifica′tion; pet′rify; scientif′ic; specif′ic. (See *fect-, fic-, fy-.*)

facet, Fr. *facette,* little face.

fæces, L. *fæx,* pl. *fæces,* dregs. fe′cal; def′ecate.

falc-, L. *falx (falc-),* sickle. fal′cate; fal′ciform; fal′con (L. *falco*).

famil-, L. *familia,* household. fam′ily; superfam′ily.

fascia, L. *fascĭa,* band. fas′ciate; fascic′ulus (dim. of L. *fascis,* bundle); fascic′ulate; Fasci′ola, little band (fluke worm).

fastig-, L. *fastīgium,* summit (<*fastīgo,* raise to a point). fastig′iate; fastig′ium.

fat, AS. *fæt,* fat. fatty.

fatigue, L. *fatīgo,* weary, tire.

fauna, L. *Fauna,* a woodland deity. a′vifauna; faun′al; faunis′tic.

feather, AS. *fether,* feather.
fect-, L. *facio (fectum),* make (see *fac-*). infec'tion.
fecund-, L. *fecundus,* fruitful, prolific. fecunda'tion.
felis, L. *fēlis,* cat. fe'line; Fe'lidæ, cat family.
fem-, L. *femella,* young woman. fe'male; fem'inine (L. *femina,* woman).
femur, L. *femur,* thigh. fem'oral.
fenestra, L. *fenestra,* window. fen'estrate.
fer-, L. *fero (latum),* bring, bear (see *lat-*). af'ferent, toward bring; co'nifer, cone bearer; differentia'tion; ef'ferent, out carry.
ferment, L. *fermentum,* yeast. fermenta'tion.
fern, AS. *fearn,* fern.
fertil-, L. *fertĭlis,* producing (*fero,* bear). fertiliza'tion; fertili'zin.
fetus, fœtus, L. *fētus* or *fœtus,* offspring. fe'tal.
fibr-, L. *fibra,* fiber, filament. fibril'lar; fi'brin; fi'brous; fi'bro-vas'cular.
fibula, L. *fibula,* a clasp, buckle (<*figo,* fasten). fib'ula; fibula're.
fic-, <L. *facĭes,* external form (see *fact-*). superfic'ial (>Fr. surface).
fig, Fr. *figue,* L. *fīcus,* fig. fig-wasp.
fil-, L. *fīlum,* thread. fil'ament; Fila'ria (threadworm) ; fil'iform; filter (LL. *filtrum,* felt).
fili-, L. *fīlius,* son; *fīlia,* daughter. fil'ial.
filic-, L. *filix (filic-),* fern. Filici'næ (ferns); fil'icoid, fernlike.
film, AS. *fylmen,* skin; AS. *fell,* hide. surface-film.
filter, LL. *filtrum,* felt (<L. *fīlum* thread). fil'terable; infil'trate.
fimbr-, L. *fimbriæ,* fringe. fim'briate.
fin, AS. *fin.* fin-ray.
fin-, L. *fīnis,* end, limit, boundary. affin'ity; con'fine.
finch, AS. *finc,* finch.
finger, AS. *finger* (<pre-Teut. *penqe,* five).
fish, AS. *fisc,* fish < L. *piscis,* fish.
fissi-, L. *fissus,* cleft, split. bi'fid, split in two; fis'sion; fis'siped, toed foot.

flagellum, L. *flagellum,* scourge (dim. of *flagrum,* whip, akin to flag). flagel'la (pl., see p. 57); flag'ellate.

flamingo, Port. *flamingo* (<L. *flamma,* flame).

flax, AS. *fleax.*

flect-, L. *flecto (flexus),* bend. deflexed; flex'ible; flex'or, bender; inflect; reflex.

flor-, L. *flōs (flōris),* flower < *floreo,* bloom. flo'ra (L. *Flora,* goddess of flowers); flores'cence; flo'ret (dim.); flore'tum, flower garden; multiflo'rous, many flowered.

flounder, OF. *flondre;* Sw. *flundra,* flounder.

flu-, L. *fluo (fluxum),* flow. con'fluent; Difflu'gia (L. *diffluo,* flow apart); efflu'via; flu'id; flu'viatile (L. *fluviātilis,* of a river); fluores'cence, *i.e.* showing varied wave lengths of light; in'flux; fluctua'tion (L. *fluctuo,* move up and down like waves). (See chart, p. 17.)

fluke, AS. *flōc,* flatfish. fluke worm, *i.e.* shape of flat-fish.

fly, AS. *fleōge,* fly. but'terfly, *i.e.* yellow fly; drag'onfly. (See chart, p. 17.)

foli-, L. *folium,* < Gr. *φύλλον, phyllon,* leaf. exfo'liate; fo'liage; folia'ceous.

foll-, L. *follis,* bag. fol'licle, little bag; follic'ular.

food, AS. *fōda,* food. food-vacuole.

foot, AS. *fōt,* pl. *fēt,* foot.

for-, L. *foro,* bore, pierce. fora'men (L. *forāmen,* opening); Foraminif'era, holes bearing; per'forate.

for-, L. *fŏris,* door, abroad. for'age, out going; for'eign.

forceps, L. *forceps,* tongs, pincers (<*formus,* hot + *cap-,* take). for'cipate.

forfic-, L. *forfex,* pair of scissors. Forfic'ula, dim. (earwig).

form-, L. *forma,* shape, figure. deform'; forma'tion; for'mula; perform'; preforma'tion, before likeness.

formic-, L. *formīca,* ant. for'mic; Formi'ca, ant genus; for'micary.

fortuit-, L. *fortuītus,* accidental (<*fors,* chance). fortu'itous; for'tune.

foss-, L. *fossus,* dug. fos'sil; fos'silize; fosso'rial, digger.

fovea, L. *fŏvĕa,* pit. fove'ola (dim.).

fowl, AS. *fugol,* feathered.

fox, AS. *fox;* Germ. *fuchs.*

fract-, L. *frango* (*fractum*), break. frac'tion; frac'ture; frag'ile (L. *fragilis,* easily broken); frail; refract'; Sax'ifrage, rock breaker.

frater, L. *frater,* brother. frater'nal.

frenum, L. *frēnum,* a restraining band. fren'ulum (dim.).

frig-, L. *frīgus,* coldness. frig'id; refresh'.

frog, AS. *frogga, frocga,* frog.

frond, L. *frons (frond-),* leaf.

front, L. *frons* (*front-*), forehead, brow. confront'; fron'tal; fron'tispiece (L. *fronti-spicium,* at front to be viewed).

fruct-, fruit-, L. *fructus,* fruit (<*fruor* (*frŭĭtus*), enjoy). fruit'ful; fructifica'tion.

Fuchsia, <Leonard Fuchs, German botanist (*ca.* 1540).

Fucus, Gr. φῦκος, *phukos,* seaweed > L. *fūcus,* reddish purple. Fu'cus.

fug-, L. *fugio,* flee. centrif'ugal, moving from center; fuga'cious; ver'mifuge.

fumig-, L. *fūmus,* smoke, vapor. fumiga'tion (*fumis* + *ago,* drive).

fun-, L. *fūnis,* rope. fu'nicle; funic'ulus, string.

funct-, L. *functio,* performance < *fungor (functus),* execute. func'tion.

fundus, L. *fundus,* bottom. founda'tion; fun'dament; infundib'ulum.

fungus, L. *fungus,* fungus, mushroom (<Gr. σφόγγος, *sphongos,* sponge). fungiv'orous, fungus eater; fun'goid, fungus like.

furca, L. *furca,* pitch-fork. bi'furcate, two forked; fork; fur'cula.

fūs-, L. *fundo (fūsum),* pour. diffu'sion spread out; fun'nel; fu'sion; Infuso'ria, in poured; transfuse.

fus-, L. *fūsus,* spindle. fu'siform.

-fy, <L. *facio,* make. clas'sify; mag'nify; os'sify; spec'ify.

G

gæ-, ge-, Gr. γαῖα, *gaia,* γῆ, *gē,* earth. hypogæ'ous, beneath earth.

galact-, Gr. γάλα (γαλακτ-), *gala (galakt-),* milk (cf. *lact-*). galac'tic; galactoph'orous. (Mem. gal'axy, the Milky Way.)

galea, L. *gălĕa,* helmet. ga'leated.

gall, L. *galla,* gallnut. gall-wasp.

gall, AS. *gealla,* gall (yellow). gall duct.

gall-, L. *gallus,* cock; *gallīna,* hen. gallina'ceous; gal'linule.

gam-, Gr. γαμέτης, *gametēs,* husband; γάμος, *gamos,* marriage. Cryp'togam; gam'ete, reproducing cell; gametogen'esis, gamete development; gam'etophyte, marriage plant; gamopet'alous; polyg'amy, many marriages.

Gammarus, NL. <Gr. κάμμαρος, *kammaros,* lobster.

gan-, Gr. γάνος, *ganos,* bright. Ganoi'dea, enamel like (fish).

gangl-, Gr. γάγγλιον, *ganglion,* tumor. gang'lion.

gar, AS. *gār,* spear. gar'fish; gar'lick (AS. *leāc,* leek).

gas, ?<Gr. χάος, *chaos,* space. gas (coined word).

gastr-, Gr. γαστήρ, *gastēr,* belly. gas'tric; gastocne'mius, belly of the leg; Gastrop'oda, belly footed (snails); gas'trula, little stomach.

gavial, Hind. *ghariyāl,* crocodile.

gazelle, OF. *gazel,* wild goat < Arab. *ghazal,* fawn > NL. *gazella.*

ge-, Gr. γῆ, *gē,* earth, land (cf. *gæ-*). geol'ogy, earth science; geot'ropism, to earth turning.

gel-, L. *gelu,* ice, cold. congeal'; gelat'inous; gela'tion; jelly. (Cf. *sol-.*)

gemin-, L. *geminus,* twin, duplicate. gem'inate; trigem'inal, triplicate.

gemma, L. *gemma,* bud. gemma'tion; gem'mule (dim.).

gen-, L. *genero,* bring to life; Gr. γενεά, *genea,* birth; Gr. γένεσις, *genesis,* origin, descent. biogen'esis, life origin; endog'enous, within produced; eugen'ics, good birth;

gēne; geneal′ogy, descent study; genera′tion, a begetting; genet′ics; genita′lia, productive organs; gen′uine (L. *genuīnus,* natural, innate); homoge′neous, alike origin; ox′ygen, acid former; prog′eny (L. *prōgentes,* lineage, offspring); regenera′tion.

gen-, L. *genu,* knee. genic′ulate, elbowed; genuflec′tor, knee bender.

Gentiana, <L. *Gentius,* King of Illyria, reported by Pliny to have discovered the medicinal value of the gentian plant. gen′tian.

genus, L. *genus,* origin, race, kind. degen′erate, lower kind; gen′era (pl.); gen′eral (L. *generālis,* belonging to a kind); gener′ic; gen′erous (L. *generōsus,* of noble birth); subge′nus, almost genus.

gephyr-, Gr. γέφυρα, *gephyra,* bridge. Gephyre′a, connecting-link worms.

ger-, L. *gĕro (gestum),* bear. Globigeri′na; ovig′erous, egg producing.

geranium, <Gr. γέρανος, *geranos,* crane. gera′nium, cranes-bill.

germ, L. *germen (germin-),* sprig. ger′micide, germ killer; germina′tion; germ-plasm, basic form.

geron-, Gr. γέρων, *gerōn,* old man. geron′tic; phylogeron′tic, racial old age.

gest-, L. *gĕro (gestum),* carry. diges′tion, apart carry; eges′tion; gesta′tion; inges′tion, in carry.

gigant-, Gr. γίγας, *gigas,* giant. gi′gantism.

gill, Dan. *giælle,* gill. gill-arch; gill-cleft.

ginger, L. *zingiber,* Gr. ζιγγίβερις, *zingiberis,* ginger.

gingiv-, L. *gingīvæ,* gums of the teeth. gingi′val.

giraffe, Span. *girafa* < Ar. *zaraf,* giraffe.

girdle, AS. *gyrdel,* belt. pec′toral gir′dle.

gizzard, L. *gigeria,* cooked entrails of fowl.

glabr-, L. *glăber,* without hair. gla′brate; gla′brous.

glac-, L. *glaciālis,* icy (<L. *gelu,* cold). gla′cial.

gladiolus, L. *gladiolus,* sword-lily (<L. *gladius,* sword). Gladi′olus (the genus), gladio′lus (common though erroneously pronounced name).

gland, L. *glans (glandis),* nut, acorn (contr. of L. *galans,*

akin to Gr. βάλανος, *balanos, q.v.)*. (See *juglans*, p. 26.) glan'dular.

glauc-, Gr. γλαυκός, *glaukos,* bluish-gray. glau'cous.

glen-, Gr. γλήνη, *glēnē,* pupil of eye, socket. Eugle'na, good eye; gle'noid, socket like.

glia, Gr. γλοία, *gloia,* glue (see *glœa*). gli'a cells; neurogli'a or neuro'glia.

glob-, L. *glŏbus,* ball. Globigeri'na, ball bearing; glob'ule (dim.); hæmoglo'bin, blood ball.

gloch-, Gr. γλωχίς, *glōchis,* arrow-point. glochid'ium.

glœa-, glea-, Gr. γλοία, *gloia,* glue (see *glia-*). Glœothe'ce, glue cover; mesoglœ'a, middle glue.

glomer-, L. *glŏmus (glomer-),* ball of yarn. conglom'erate; glomer'ulus, rolled into a little ball.

gloss-, Gr. γλῶσσα, *glōssa,* or γλῶττα, *glōtta,* tongue. Balanoglos'sus, acorn proboscis; epiglot'tis (*epi* + Gr. γλῶττις, *glōttis,* opening of windpipe); Glossi'na.

gluc-, glyc-, Gr. γλυκύς, *glykus,* sweet. glu'cose; glyc'erine; glyc'erol; gly'cogen; licorice (see p. 22).

glum-, L. *glūma,* husk < L. *glūbo (glupt-),* peel. gluma'ceous; glume.

glut-, Gr. γλουτός, *gloutos,* rump. glute'al.

glut-, L. *glūtio,* swallow, gulp. deglutit'ion, swallow down.

glutin-, L. *glūtino,* glue. agglutina'tion, together gluing; glu'tinous.

glyph, Gr. γλυφίς, *glȳphis;* γλύφη, *glyphe,* carving, notch. Glyp'todon (Gr. γλύπτος, *glyptos,* carved + tooth); hi'eroglyph, sacred carving; siphonog'lyphē, tube groove.

gnat, AS. *gnæt.*

gnath-, Gr. γνάθος, *gnathos,* jaw. ag'nathous, without jaw; gnath'opod.

gnom-, Gr. γνώμων, *gnōmōn,* indicator, a judge. physiog'nomy.

gnos-, Gr. γνώσω, *gnōsō,* will know (see *gnom-*). diagno'sis; prognos'tic, foreknowledge.

goat, AS. *gat* (<L. *hædus*) , kid.

Golgi, Camillo Golgi, Italian anatomist (1844-1919). Gol'gi bodies.

gon-, Gr. λόνος, *gonos,* reproduction, offspring, seed. (Cf.

gen-.) archego′nium, original womb; gon′ad, reproductive organ; gōnan′gium, bud case; gŏnothe′ca, reproductive envelope.

goni-, Gr. γωνία, *gōnia,* angle. diag′onal; Gonione′mus, angled tentacle; pol′ygon.

goose, AS. *gōs* (pl. *ges*) = Germ. *gans.*

gopher, <Fr. *gaufre,* honeycomb (referring to burrows).

Gordius, Gr. Γόρδιος, *Gordios,* who invented a knot which could not be untied. Gordia′cea, snarled horsehair worms.

gorilla, O.Afr. *gorilla,* chimpanzee.

gorgon, Gr. Γοργώ, *Gorgō,* the Gorgon, a monster with snaky hair, the sight of which turned beholders to stone; hence L. *gorgonia,* coral. (See *medusa.*)

gourd, Fr. *gourde* (<L. *cucurbita,* gourd).

grad-, L. *gradior,* walk. degree′; dig′itigrade, finger-toe walker; gra′dient, step by step; grad′uate, by degrees (see p. 41); plan′tigrade, sole walker; ret′rograde; transgress′.

graft, Gr. γραφίον, *graphion,* style, pencil. graft′ing.

grall-, L. *grallæ,* stilts (<L. *gradus,* step). gral′latory (wading birds).

gram-, Gr. γράμμα (γραμματ-), *gramma (grammat-),* something written. (Cf. *graph-*.) di′agram.

grampus, Span. *grand pez,* great fish.

gran-, L. *grānum,* grain. grain; gran′ite; granula′tion; gran′ulocyte.

grape, OF. *grape,* bunch of grapes (<OF. *graper,* gather grapes, literally to hook, grapple, or grab).

graph-, Gr. γράφω, *graphō,* write, describe. biog′raphy; engrave′; graph′ite; topog′raphy.

grass, AS. *græs, gærs,* grass. grass′hopper (AS. *gærshoppa*).

grav-, L. *gravis,* heavy. grav′id; gravipor′tal, weight carrying; gravita′tion.

grebe, Fr. *grèbe.*

greg-, L. *grex (gregis),* herd, troop. aggrega′tion; grega′rious, of a crowd; Gregari′na; seg′regate, apart from the crowd.

grouse, false singular from early Eng. *grice* (<Fr. *gris,* gray).

growth, AS. *grōwan,* grow (applied to plants; growth of animals = AS. *weaxan*).

gryllus, L. *gryllus,* Gr. γρύλλος, *gryllos,* cricket.

guinea, *Guinea,* coast country of West Africa. guinea-hen; guinea-pig (*Guiana,* S.Am.); guinea-worm (Dracunculus).

gula, L. *gŭla,* throat. gu'lar.

gull, Corn. *gullan,* gull, formerly any bird.

gurg-, L. *gurges,* whirlpool (akin to *gula,* throat). ingur'gitate, swallow; regur'gitate.

gust-, L. *gustus,* sense of tasting. gus'tatory.

gut, AS. *gut* (<*geōtan,* pour), gut. (Cf. yarn < ON. *görn,* gut < L. *hernia,* rupture.)

gutta, L. *gutta,* drop of liquid. gut'tæ (pl.); gutta'tion.

gymn-, Gr. γύμνος, *gymnos,* naked. Gym'nosperm, naked seed.

gyn-, Gr. γυνή, *gȳnē,* woman, female. epig'ynous, on ovary; er'gatogyne, worker-female; gynan'dromorph, ♀ ♂ form; gynœce'um, female abode; polyg'ynous, many pistils.

gyr-, Gr. γυρός, *gyros,* circle, round. Spirogy'ra, coil around.

H

hab-, L. *habeo (habitum),* have, hold, occupy. abil'ity (L. *habilitas);* a'ble (L. *habilis,* handy); exhib'it, hold out; habit (L. *habitus,* formed); hab'itat; habit'ual; inhab'itant; inhib'it; inhib'itor.

hæm-, hem-, Gr. αἷμα (αἱματ-), *haima (haimat-),* blood. anæ'mia, without blood; hæmatozo'a, blood parasites; hæmoglo'bin; hem'orrhage, blood burst (Gr. ῥήγνυμι, *rhēgnumi,* burst).

hair, AS. *haer,* hair. hairworm; hairy.

hal-, L. *hālo,* breathe. exha'lant; hal'itus, breath; inha'lant.

hal-, Gr. ἅλς, *hals,* sea, salt. hălobi'os, marine life; hal'ogen; hal'ophyte, salt plant.

halibut, ME. *hali,* holy + *butte,* flounder (*i.e.* eaten on holy days).

hallux, L. *hallex,* great toe. prehal'lux.
halter, AS. *hælfter,* rope, strap.
hamus, L. *hāmus,* hook. ham'ulus, little hook.
hand, AS. *hand,* hand.
hapl-, Gr. ἁπλόος, *haploos,* single, simple. hap'lodont, simple tooth; hap'loid.
hapto-, Gr. ἅπτω, *haptō,* fasten to, touch. hap'teron, fastener; hap'togen; hap'tophore.
hast-, L. *hasta,* spear. has'tate.
haust-, L. *haustrum,* water pump (<L. *haustus,* drawn). exhaust'; haus'tellate; hausto'rium.
hawk, AS. *heafoc,* OE. *hauek,* ME. *hauk,* hawk.
hazel, AS. *hæsel.*
head, AS. *heăfod,* head.
heart, AS. *heorte,* heart.
hebe, Gr. ἥβη, *hēbē,* youth. ephebic (*epi* + *hebe;* ἔφηβος, *ephēbos,* arrived at manhood).
hecto-, Gr. ἑκατόν, *hekaton,* hundred. hectocot'yl, hundred cups; hectoli'tre.
hĕl-, Gr. ἕλος, *helos,* marsh-meadow. helo'bious.
hēl-, Gr. ἧλος, *hēlos,* nail, ornamental stud. Heloder'ma, studded skin (Gila monster).
helio-, Gr. ἥλιος, *hēlios,* sun. Helian'thus, sunflower; heliotax'is; heliot'ropism, turning to the sun; Heliozo'a, sun animalcules.
helix, Gr. ἕλιξ, *helix,* spiral. hel'icite, snail fossil; He'lix (snail).
hell-, AS. *helan,* conceal. hell'bender, concealing twister.
helminth-, Gr. ἕλμινς (ἑλμινθ-), *helmins (helminth-),* worm. helminthol'ogy, worm study; Platyhelmin'thes, flat worms.
helot-, L. *Hēlōtes,* Gr. Εἱλῶται, *Heilōtai,* slaves of the Spartans. he'lotism, slavery.
hem-, See *hæm-.*
hemi-, Gr. ἡμί-, *hēmi-,* prefix, half (=L. *sēmi-*). Hemichor'da, half-length notochord (Balanoglossus); Hemip'tera, half-winged (bugs).
hen, AS. *hæn,* fem., *hana,* masc., domestic fowl.
hepat-, Gr. ἧπαρ (ἥπατ-), *hēpar (hēpăt-),* liver. hepat'ic; He-

pat′icæ, liverworts.

her-, L. *hæro (hæsum),* stick. adhere; cohe′sion; inhe′rent.

herb-, L. *herba,* grass, herbage. herba′ceous; herba′rium, plant collection; herbiv′orous, grass eater.

hered-, L. *hēres (hered-),* heir. hered′ity; her′itable; inherit.

hermaphrodite, Gr. Ἑρμῆς, *Hermēs* + Ἀφροδίτη, *Aphroditē.*

hermit, Fr. *hermite* or *ermite;* Gr. ἐρημίτες, *erēmites,* hermit (<Gr. ἔρημος, *erēmos,* solitary). (See *erem-.*) hermit crab.

heron, Fr. *héron.*

herring, AS. *haering* (<AS. *here,* army, or AS. *hār,* gray, hoary).

hesper-, Gr. ἕσπερος, *hesperos,* evening, West. hesper′idum (see p. 8); Hesperor′nis.

heter-, Gr. ἕτερος, *heteros,* other, different. heterog′amy, unlike mating; heteros′pory, different spores; heteron′omy; Heterop′tera, varied wing; heterozy′gous, unlike joined.

hex-, Gr. ἕξ, *hex,* six. hex′acanth, six prongs; Hexactinel′lida, six points; hex′apod, six legged.

hiatus, L. *hiātus,* gap, opening. hia′tus, pl. hia′tus or hia′tuses.

hibern-, L. *hīberno (hībernat-),* spend the winter. hibernac′ulum (L., hut for winter quarters); hiber′nal; hiberna′tion.

Hibiscus, L. *hibiscus,* Gr. ἱβίσκος, *hibiskos,* mallow plant.

hickory, Am. Ind. *hickory* (>NL. *Hicoria,* for genus).

hilum, L. *hīlum,* a trifle. hi′lum.

hip, AS. *hype.*

hipp-, Gr. ἵππος, *hippos,* horse. Eohip′pus, dawn horse; Hippopot′amus, river horse.

hirsut-, L. *hirsūtus,* rough. hir′sute.

hirud-, L. *hirūdo,* leech. hiru′din, secretion by leeches; Hirudin′ea, leeches.

hirund-, L. *hirundo,* swallow (bird). Hirundin′idæ, swallow family.

hisc-, L. *hisco,* open, yawn. dehis′cence, off opening.

hisp-, L. *hispidus,* hairy. his′pid; hispid′ulous.

hist-, Gr. ἱστός, *histos,* web, tissue. histogen′esis, tissue formation; histol′ogy, tissue study.

holo-, Gr. ὅλος, *holos,* whole, entire. Hŏlarc′tic, entire Arc-

tic; hŏloblas′tic, entire germ; Hŏlometab′ola, complete metamorphosis; hol′ophyte, complete plant.

holothuri-, Gr. ὁλοθούριον, *holothourion,* sea cucumber. Holothurioi′dea, sea cucumber like.

Homarus, NL. *homărus* < OF. *homar,* lobster. Hom′arus.

homin-, L. *homo (homin-),* man. Homin′idæ, man like; human.

homo-, Gr. ὁμός, *homos,* same, belonging to several in common; Gr. ὁμοῦ, *homou,* together. anom′alous, not the same; homol′ogy, related arrangement; Homop′tera, similar wings; homozy′gous, same linked; phy′tome, plants collectively; zoöme.

homœo-, homoio-, Gr. ὅμοιος, *homoios,* same, like. homœom′erous, similar parts; homœozo′ic; homoiother′mic, same temperature.

honey, AS. *hunig.* hon′eycomb (AS. *hunigcamb*); hon′eydew; honeysuck′le (AS. *hunisuce* < AS. *sūcan,* suck).

hormon-, Gr. ὁρμάω, *hormaō,* set in motion. hor′mo-nēs or hor′mones, exciters; phytohor′mone.

hornet, AS. *hyrnet,* humming wasp.

horse, AS. *hors,* OSw. *hros,* OG. *ros,* horse; AS. *horsc,* swift. horse-chestnut (nuts ground and fed to horses); horse-clam (large clam); horse-fly; horse-mint; sea-horse.

hort-, L. *hortus,* garden, orchard (see *orchard*). hor′ticulture.

hosp-, L. *hospes (hospit-),* host, guest. hos′pitable; host.

huckleberry, ME. *hurtleberry* < *whortleberry* < AS. *wyrt,* root.

humerus, L. *humĕrus,* shoulder. hu′meral.

humor, L. *hūmor,* animal fluid (<L. *hūmeo,* be moist). hu′mid; hu′moral; vit′reous hu′mor.

humus, L. *hŭmus,* ground. hu′mus.

hyacinth, Gr. Ὑάκινθος, *Hyakinthos,* Hyacinthus (see p. 6).

hyæna, Gr. ὕαινα, *hyaina,* hog-like (<Gr. ὗς, *hus,* hog (imitative)). (Name suggested by bristly hog-like mane.) hy′odont.

hyal-, Gr. ὕαλος, *hyalos,* glass. hy′aline; hy′aloplasm, glass formation.

hybrid, L. *(h)ibrida,* mongrel. dihy′brid, twice mongrel; hybridiza′tion.

hyd-, Gr. ὕδωρ, *hydōr,* water. hyd′atid, water vesicle; hy′drogen, water maker; hy′drophyte, water plant.

hydr-, Gr. Ὕδρα, *Hydra,* a water serpent. hy′dranth, Hydra bud; hy′dric, amphibious; hy′droid, Hydra like; hydrothe′ca, Hydra cover; Hydrozo′a, Hydra animals.

hygien-, Gr. ὑγιαίνω, *hygiainō,* be healthy. hy′gi-ēne or hy′giene.

hygr-, Gr. ὑγρόν, *hygron,* wetness, moisture. hy′gric, requiring humidity; hygrom′eter; hygroscop′ic, moisture detector.

hyl-, yl-, Gr. ὕλη, *hylē,* wood, forest, matter. eth′yl, spirit wood (Gr. αἰθήρ, *aithēr,* ether); Hy′la, tree frog; Hylob′ates, wood walker (gibbon); hylozo′ism, matter alive doctrine; meth′yl.

hyoid, Gr. Υ + εἶδος, Υ (upsilon) + *eidos,* Y-shaped.

hymen-, Gr. ὑμήν, *hymēn,* membrane. hyme′nium (dim.); Hymenop′tera, membrane winged (wasps).

hyper-, Gr. ὑπέρ, *hyper,* over (=L. *super).* hyperbor′ean, extreme north; hyperpar′asite; hyper′trophy, over nutrition.

hypha, Gr. ὑφή, *hyphē,* web. hyphæ (pl.); hy′phal.

hypo-, Gr. ὑπό, *hypo,* under (=L. *sub).* hy′pocotyl, under cotyledon; hypoder′mis, under skin; hypoph′ysis, under projection; hypos′tasy; hy′postome; hypoth′esis.

hyps-, Gr. ὕψι, *hypsi,* high; ὕψος, *hypsos,* height. hyp′sodont, high crowned teeth; hypsom′eter, altitude instrument.

I

-iasis, *-iasis,* suffix denoting disease (Gr. Ἰασώ, *Iāsō,* goddess of healing). elephanti′asis; myi′asis, maggot disease; Trichini′asis.

iatr-, Gr. ἰατρός, *iatros,* physician. ia′tro-chem′istry; psychi′atry, mind treatment.

ichn-, Gr. ἴχνος, *ichnos,* footstep. ichneu′mon (Gr. ἰχνεύμων, *ichneumōn,* tracker, a rat-like animal that hunts eggs of

crocodiles); ichneu′mon-fly; ich′nolite, footprint fossil; ichnol′ogy, fossil footprint study; ornithich′nite, bird track fossil.

ichthy-, Gr. ἰχθύς, *ichthys,* fish. ichthyol′ogy, fish study; Ichthyosau′ria, fish reptile.

idea, Gr. ἰδέα, *idea,* mental picture. ide′a; id′eograph, a symbol (not idiograph, a trademark).

ident-, L. *identicus* (<L. *īdem,* same). iden′tical, identifica′tion.

idio-, Gr. ἴδιος, *idios,* one's own, private. idiosyn′crasy, personal mixture. Cf. id′iom and id′iot (Gr. ἰδιώτης, *idiōtēs,* an ordinary person; see p. 10).

ileum, L. *ileum,* small intestine (<Gr. εἴλω, *eilō,* twist).

ilium, L. *ilium,* flank, hip.

imago, L. *imāgo (imagin-),* image, representation. imag′inal; ima′go, adult state.

imbr-, L. *imbrĭces,* roof tiles (<L. *imber,* rain). im′bricate.

immun-, L. *immūnis,* exempt (L. *in* + *mūnus,* public office). immu′nity; im′munize.

in-, L. *in (il-, im-, ir-),* before verb: in, into, on, upon. *il*lu′minate: *im*′migrate; *im*plant: *in*cis′ion; *in*ci′sor: *ir*ra′diate; *ir*′ritate.

in-, L. *in (en-, il-, im-, ir-),* before adjective: not, without. *en*emy (L. *inimicus* < *amicus,* friend): *il*legit′imate: *im*per′vious: *in*adapta′tion; *in*complete; *in*divid′ual; *in*ver′tebrate: *ir*reg′ular.

indigen-, L. *indĭgĕna,* native (L. *indu,* in + *gen-,* born). indig′enous.

indus-, L. *indusium,* tunic (<L. *induo,* put on). indu′siate.

infant, L. *in,* not + *fari,* speak. in′fantile.

infra, L. *infrā,* beneath (=L. *inferus,* below, *inferior,* lower). infraba′sals; infra-red.

infus-, L. *infundo (infūs-),* to pour on. infundib′ulum (L. *infundibulum,* funnel); Infuso′ria, infusion animals.

ingluvies, L. *inglŭvies,* crop (L. *in* + *glutio,* swallow). inglu′vial.

inguin-, L. *inguen (inguin-),* groin. in′guinal.

inhibitor, L. *inhibĭtus,* restrain (L. *in* + *habeo,* have). inhib′itor.

inquiline, L. *inquilīnus,* living in another's place (L. *in* + *colo,* dwell). in'quiline, lodger.

instar, L. *instar,* likeness. in'star.

insul-, L. *insula,* island. in'sulate; island; is'olate or i'solate (It. *isola,* island).

inter-, L. *inter (intel-),* between, among. *intel*'ligence (L. *lego,* choose): *inter*cel'lular, between cells; *inter*cos'tal, between ribs; *in'ter*node, between knots.

intr-, L. *intrā, intrō,* within. *intra*cel'lular, within cell; *intrin*'sic (L. *intra* + *secus,* by); *intro*duce; *intro*mit'tent, into send.

intrors-, L. *introrsus,* inward (=L. *introversus*). in'trorse.

intus-, L. *intus,* within. inte'rior (comp.); inter'nal; intes'tine (L. *intestīnus,* inward); in'tima (superl.); intussuscep'tion, within receive.

involucr-, L. *involūcrum,* wrapper. invol'ucel (dim.); in'volucre.

iod-, Gr. ἰο-ειδής, *io-eidēs,* violet colored. i'odine; iodothy'rin, thyroid iodine.

ion, Gr. ἰών, *iōn,* going (<Gr. ἰέναι *ienai,* to go). cat'ion (Gr. κατά, *kata,* across); ion'ic.

iris, Gr. ἶρις (ἰριδ-), *iris (irid-),* rainbow. ir'ides or i'rises (pl.); irides'cent.

irrit-, L. *irrīto (irrītātus),* excite. irritabil'ity; irrita'tion.

ischi-, Gr. ἰσχίον, *ischion,* hip-joint. is'chium; Sauris'chia, reptile hip; sciat'ic (through Fr. *sciatique*).

iso-, Gr. ἴσος, *isos,* equal. isog'amy, equal marriage; isom'erism, equal parts; Isop'oda, equal legs (sowbugs); i'sotope, equal place.

-itis, suffix indicating inflammation < Gr. -ῖτις, *-itis,* feminine suffix. arthri'tis; neuri'tis.

ivy, AS. *ifig.*

-izesis, Gr. ἵζω, *hizō,* place, settle down. synize'sis, settled down together, condensation.

J

jac-, ject-, L. *jacio (jact-)*, throw, cast. ejac'ulatory duct; injec'tion; ob'ject.

jaw, ME. *jawe*, jaw (<AS. *ceōwan*, chew). jowl (AS. *ceafl*).

jay, OF. *gai*, jay, *i.e.* quick.

jejunum, L. *jejūnus*, hungry. jeju'num.

jug-, L. *jŭgum*, yoke, marriage-tie. conjuga'tion, together coupled; jug'ular (L. *jŭgŭlum*, collar-bone, throat); yoke.

junct-, L. *jungo (junctum)*, join. conjunc'tion; disjunc'tion, unjoin; joint; junc'ture.

juncus, L. *juncus*, a rush. jon'quil (Fr. dim.); jun'co, reed-bird; jun'cus; junket (soft cheese served on a dish made of reeds).

juniper, L. *junĭpĕrus* (<L. *juvenis*, young + *pario*, bear).

Jura, *Jura*, mountains between France and Switzerland. Juras'sic.

just-, L. *justus*, just, right, lawful. adjust'ment.

juven-, L. *juvenesco*, grow young (L. *juvenis*, youth). ju'venile; rejuvenes'cence.

juxta, L. *juxtā*, near to. *juxta*posit'ion.

K

kangaroo, Australian native, *kangaroo*.

kary-, cary-, Gr. *κάρυον*, *karyon*, nut. karyog'amy, nuclear mating; karyokine'sis, nucleus movement; kar'yosome, nucleus body.

kata-, same as cata, *q.v.*

keim-, Germ. *keim*, germ. keimbahn (Germ. *bahn*, track); keimplas'ma.

kelp, ME. *culpe,* seaweed.

kermes, Ar. *girmiz,* plant louse. Cher'mes (var.); car'mine (<*girmiz* + L. *minium,* red pigment; see p. 24).

kidney, ME. *kidnere* (<AS. *cwith,* womb + Ice. *nyra,* kidney).

kinesis, Gr. κίνησις, *kinēsis,* movement. karyokine'sis; kine'siology; neokine'sis. (See *cin-*.)

knee, AS. *cneōw,* knee. knee-joint.

krumm-, Ger. *krumm,* crumpled, crooked. krumm'holz (Ger. *holz,* wood, trees).

L

lab-, L. *lăbium, lăbrum,* lip. label'lum; la'bial; la'biate; la'brum.

labor, L. *lăbor,* toil. laborato'ry.

labyrinth, Gr. λαβύρινθος, *labyrinthos,* winding cave. lab'yrinth; Labyrinth'odonts.

lacerta, L. *lăcerta,* lizard. Lacertil'ia (lizards).

lacinia, L. *lacĭnĭa,* lappet, flap. lacin'iate.

lacrima, L. *lacrĭma,* tear. lac'rimal.

lact-, L. *lac (lact-),* milk. lacta'tion; lac'teal; lactif'erous, milk bearing.

lacuna, <L. *lăcus,* basin, lake. lacu'næ (pl.); lacu'nal.

lam-, L. *lambo,* lick. Lampe'tra (L. *petra,* rock); lam'prey; lim'pet.

lamel-, lamin-, L. *lamina,* thin plate, blade; *lamella* (dim.). delamina'tion, off plating; lam'ellate.

lanc-, L. *lancea,* small spear. lan'celet; lan'ceolate; lan'cet.

lanugo, L. *lanūgo,* down, soft hair. lanu'ginous.

laps-, L. *lābor (laps-),* fall, glide. collapse', fall together; relapse'.

larch, L. *larix,* Gr. λάριξ, *larix,* larch.

lark, ME. *larke* (<AS. *lāwerce*).

larva, L. *larva,* mask. lar'val.

larynx, L. *larynx (laryng-),* gullet. laryn'geal.

lat-, L. *fero (lātum),* carry, bear, bring. correla'tion; rela'tion; rel'ative; transla'tion.
lat-, L. *lătĕo,* lie hidden. lat'ebra, hiding place; la'tent.
lat-, L. *lātus,* wide, broad. dila'tion; lat'itude.
lat-, L. *lătus,* side, flank. bilat'eral; lat'erad, toward the side; lat'eral (L. *lăteris,* side).
latex, L. *lătex (latic-),* fluid (<Gr. λάταξ, *latax,* drop of wine). laticif'erous, milky-fluid conveying.
leaf, AS. *leāf,* leaf. leaf'let.
lecith-, Gr. λέκιθος, *lekĭthos,* egg-yolk. isolec'ithal, evenly distributed yolk; telolec'ithal, end yolk.
lect-, L. *lĕgo (lect-),* read, choose, gather. collec'tor, gather together; el'egant, choice; in'tellect; intel'ligence (L. *inter* + *leg-*); selec'tor, choose out.
leech, AS. *laece,* healer.
leg, Ice. *leggr,* leg.
legume, L. *legūmen (legumin-),* picked crop, bean and relatives (<L. *lĕgo,* gather). leguminif'erous, pod bearing.
lemma, L. *lemma,* Gr. λέμμα, *lemma,* sheath, husk. neurilem'ma, muscle sheath.
lemming, Norw. *lemming.*
lemur, L. *lemur,* nocturnal ghost.
lent-, L. *lens (lent-),* lentil. len'ticel (dim.); lentic'ular.
lepid-, Gr. λεπίς (λεπιδ-), *lepis (lepid-),* scale. lep'idote, scurfy; Lepidoden'dron, scale tree; Lepidop'tera, scale winged (moths).
lepto-, Gr. λεπτός, *leptos,* peeled > narrow, thin. leptocephal'ic, narrow head; leptodac'tyl, slender finger.
Lepus, L. *lepus (lepor-),* hare. Lepor'idæ, rabbit family.
leth-, L. *lēthum, lētum,* death. le'thal.
lettuce, OF. *letuce* (<L. *lactūca*), lettuce, *i.e.* milky plant. (Cf. *lact-.*)
leuc-, Gr. λευκός, *leukos,* white. leu'cocyte, white corpuscle.
lev-, L. *levo,* raise, lift up. el'evate; leva'tor; lift; relieve'.
liana, Fr. *liane,* climbing vine (<L. *ligo,* bind). lia'na.
lias-, Fr. *lias,* flat stone for steps and tombstones. lias'sic.
lichen, L. *līchēn,* Gr. λειχήν, *leichēn,* tree-moss. li'chen.
life, AS. *līf,* life. alive; life-cycle; lifeless.
lig-, L. *līgo,* bind. lig'ament (L. *ligāmentum*), bandage; li'-

gate; lig′ature; lig′ula (L. *ligula,* little tongue, strap, dim. of *lingua,* tongue); ob′ligate.

lign-, L. *lignum,* wood. ligna′ceous; lig′neous; lignifica′tion.

Lilium, L. *līlium* (Gr. λείριον, *leirion*), lily. Lilia′ceæ, lily family.

limb, AS. *lim,* limb, an appendage. limb-girdle.

limb-, L. *limbus,* edge. lim′bate; lim′bus.

limn-, Gr. λίμνη, *limnē,* marshy lake. Limnæ′a (pond snail); limnet′ic; limnobi′os, pond life.

limpet, ME. *lempet* (<L. *lepas,* Gr. λεπάς, *lepas*), limpet, *i.e.* rock clinger.

Limulus, <L. *līmus,* looking sideways. Lim′ulus (dim.).

line-, L. *līnea,* line. lin′eage; lin′ear.

lingua, L. *lingua,* tongue. lan′guage; lin′guiform; lin′gulate.

link, AS. *hlence,* link. link′age.

linin, L. *līnum,* Gr. λίνον, *linon,* flax, thread. li′nin, nuclear thread.

lip, AS. *lippa,* lip.

lip-, Gr. λείπω, *leipō,* omit, lack. li′potype, omitted form.

lip-, Gr. λίπα, *lipa,* fat. lipogen′ic, fat forming; lip′oid, fat like.

liqu-, L. *lĭqueo,* melt, be liquid. liq′uefy; liq′uidate.

-lite, suffix indicating stone < Gr. λίθος, *lithos,* stone. cop′-rolite, dung stone.

lith-, Gr. λίθος, *lithos,* stone. cop′rolith, dung stone; e′olith, dawn-age stone implement; lith′ocarp, fossil fruit; lith′-ocyst, stone bag; ne′olith, new stone.

litt-, L. *litus, littus (littōr-),* shore. lit′toral.

liver, AS. *lifer,* liver. liverwort (AS. *wyrt,* plant).

lizard, <L. *lacerta,* lizard.

lob-, Gr. λοβός, *lobos,* lobe. olfac′tory lobe; tri′lobite, three lobed.

lobster, AS. *loppestre* (<L. *locusta,* lobster, crab, grasshop-per), lobster.

locus, L. *lŏcus,* place. biloc′ulate; dis′locate; lo′cal; lo′ci (pl.); locomo′tion; loc′ule; transloca′tion.

log-, Gr. λόγος, *logos,* discourse, history, relation. anal′ogy; biol′ogy, life study; homol′ogous, similar relation; or-nithol′ogy; osteol′ogy; pathol′ogy.

Loligo, L. *lolīgo,* cuttlefish. Loli′go.

long-, L. *longus,* long. elon′gate; longev′ity, long age; prolonga′tion.

loon, Ice. *lōmr,* Sw. *lom.*

loph-, Gr. λόφος, *lophos,* crest, tuft, cockscomb. Lophoc′omi, tufted hair; loph′odont, crested tooth; loph′ospore, tufted seed.

lorica, L. *lōrīca,* leather cuirass (<L. *lōrīco,* clothe in mail). lori′ca; lor′icate.

louse, AS. *lūs,* louse. bark louse; lousewort; plant lice.

lox-, Gr. λοξός, *loxos,* oblique, crosswise. lox′odont, slanting faces on teeth.

luc-, L. *lūceo,* shine (<L. *lux, lūcis,* light). Noctilu′ca, night light; pellu′cid, shining through; translu′cent.

lumb-, L. *lumbus,* loin. lum′bar.

lumbric-, L. *lumbrīcus,* earthworm. lum′brical; Lum′bricus.

lumen, L. *lūmen,* light. lu′men, an opening for light to enter, pl. lu′mina; lumines′cence.

lun-, L. *lūna,* moon (<L. *lūno,* bend into a crescent). lu′nate; lu′nule, little crescent.

lung, AS. *lungen,* lung.

lut-, (1) L. *lūteus,* saffron-yellow; (2) L. *luteus,* clay-yellow. *cor′pus lu′teum* (1); lu′teous (1, 2).

Lycopodium, Gr. λύκος, *lykos,* wolf + ποδ-, *pod-,* foot. Lycopo′dium.

lymph, L. *lympha,* clear water. lymphat′ic; lymph′ocyte, lymph cell.

lys-, lyt-, Gr. λύω, *luō,* to unfasten, dissolve. anal′ysis (Gr. ἀνάλυσις, *analysis,* separating into parts); autol′ysis, self unfastening; dial′ysis, across freeing; proteolyt′ic, protein dissolving.

M

mace-, L. *măcer,* lean, thin. ema'ciate; mac'erate; mea'gre.

macro-, Gr. μακρός, *makros,* long. mac'rogamete; macronu'cleus, long nucleus; macroscop'ic; mac'rospore, large spore.

macul-, L. *macula,* spot, stain. immac'ulate, spotless; mack'erel, speckeled fish; macula'tion.

madrepora, It. *madrepora,* coral (<Gr. μήτηρ, *mētēr,* mother, + πῶρος, *pōros,* soft stone). madrepor'ite.

maggot, W. *maceiad,* maggot.

magn-, L. *magnus,* great, large; comp. *mājor;* superl. *maximus.* mag'nify; mag'nitude; main.

magpie, Mag's pie < Mag, abb. of Margarita, lit. pearl + ME. *pie,* magpie < L. *pīca,* magpie.

maize, Span. *maiz* < Haytian *mahiz,* corn.

mal-, L. *mălus,* bad. malnutrit'ion.

mala, L. *māla,* cheekbone. ma'lar.

malac-, Gr. μαλακός, *mălăkos,* soft. malacol'ogy, mollusc study; Malacos'traca, soft shell (as compared with clam).

male, OF. *male,* male (<L. *mas, maris*). maleness; mal'lard.

mall-, Gr. μαλλός, *mallos,* wool. Malloph'aga, wool eater (bird lice).

malleus, L. *malleus,* hammer. mal'leable; mal'let; mal'leus.

Malpighian, < Marcello Malpighi, Italian zoologist (1628-1694). Malpigh'ian (hard g).

mamma-, L. *mamma,* breast (<Gr. μάμμα, *mamma,* mother). Mamma'lia, suckling animals; mam'mary.

mammoth, Tartar *mammont,* burrowing animal (because remains found in earth).

man, AS. *man,* man, think. mankind' (AS. *mancynn,* man kin).

man-, L. *mănus,* hand. manipula'tion; man'tle (hand + L. *tēla,* woven); manufac'ture; manure' (see p. 9); Quadru'mana, four hands.

manatee, W. Ind. *manati.* Manat'idæ.

mandible, L. *mandibula,* jaw (<L. *mando,* chew). mandib'ulate.

manubrium, L. *manubrium,* handle (cf. L. *manus,* hand). manu'brium.

maple, AS. *mapol.*

mar-, L. *măre,* sea. marine (L. *marīnus*); marit'imal (L. *marĭtĭmus*).

Marchantia, < Nicholas Marchant, French botanist (d. 1678). Marchan'tia (ch like k).

marg-, L. *margo (margin-),* brink, edge. emar'ginate; mar'ginal.

marigold, Mary's gold.

marit-, L. *marītus,* relating to marriage. mar'ital; mar'riage.

marmot, NL. *marmota* (<L. *mus montānus,* mountain rat, or < Fr. *marmotter,* to mutter; Ger. *murmelthier,* marmot).

marsup-, L. *marsūpium* (<Gr. μάρσιπος, *marsipos),* pouch. Marsupa'lia, pouched.

masc-, L. *mas (maris),* male; L. *masculus* (dim.). emas'culate; mas'culine.

mast-, Gr. μάσταξ, *mastax,* jaws, mouth. mas'ticate; mas'tax.

mast-, Gr. μάστος, *mastos,* breast, knoll. Mas'todon, nipple tooth; mas'toid, breast shaped or nipple-like.

mastig-, Gr. μάστιξ (μαστιγ-), *mastix (mastīg-),* whip. mastig'ium; Mastigoph'ora, whip bearing (Protozoa).

mat-, Gr. ματός, *mătos,* motion. automat'ic, self moving.

mater-, L. *māter,* mother. mater'nal (L. *māternus,* relating to a mother).

matrix, L. *mātrix,* formative substance, womb, mold (<L. *māter,* mother). ma'trices or mat'rices (pl.).

matur-, L. *mātūrus,* ripe. immatu'rity; matura'tion; pre'mature.

maxilla, L. *maxilla,* jaw-bone (dim. of *mala).* max'illate; maxil'liped, jaw leg; premaxil'la.

me-, L. *meo,* pass, flow, glide. mea'tus (L. *meātus,* passage); per'meable, through pass; per'meate.

mec-, Gr. μῆκος, *mēkos,* length. Mecop'tera, long wings; Parame'cium (<Gr. παραμήκος, *paramēkos,* oblong).

mechan-, Gr. μηχανάω, *mēchanaō,* contrive, invent. mech'-anism; mechanis'tic.
mecon-, Gr. μήκων, *mēkōn,* (1) poppy, (2) cuttlefish ink-bag. (1) meconid'ium, like a poppy seed-case; (2) meco'nium, inky discharge.
med-, L. *mĕdĕor, mĕdĭco,* cure, heal. med'ical; med'icine (L. *medicīnus,* of a physician); rem'edy.
med-, L. *mĕdius,* middle. me'dia, middle vein of insect wing; me'dian; mediasti'num (L. *mediastīnum,* being in the middle); medioc'rity; medium.
medul-, L. *mĕdulla,* marrow, innermost part (L. *medius*). med'ullary.
medusa, Gr. Μέδουσα, *Medousa,* the serpent-haired Gorgon, Medusa. Hydromedu'sa.
mega-, Gr. μέγας, *megăs,* large, wide. meg'agamete, large gamete; megaphyl'lous, broad leafed.
meio-, Gr. μειόω, *meioō,* make smaller. meio'sis; Mi'ocene, less recent.
melan-, Gr. μέλας (μελαν-), *melas (melan-),* black. mel'ancholy, black bile; melanochro'ic, black color; mel'anophore.
melon, <Gr. μῆλον, *mēlon,* apple.
membran-, L. *membrāna,* a skin (L. *membrum,* limb, member). mem'branous.
Mendel, Gregor Mendel, Austrian geneticist (1822-1884). Mende'lian segrega'tion; Men'delism.
mening-, Gr. μῆνιγξ, *mēninx,* membrane. menin'ges (pl.).
mens-, L. *mensa,* table. commen'sal, at same table.
mens-, L. *mensis,* month; *menstrŭus,* monthly. menstrua'-tion.
ment-, L. *mens (ment-),* mind. men'tal.
ment-, L. *mentum,* chin. men'tum; submen'tum, under chin.
mĕr-, Gr. μέρος, *meros,* part. hy'pomere, under part; mericli'-nal, partly surrounding; meris'tic; meroblas'tic, part germ; met'amerism, segmentation; polymer'ic; trim'er-ous, three parted.
mēr-, Gr. μηρός, *mēros,* thigh. epime'ron, above leg.
meristem, Gr. μερίζω, *merizō,* divide into parts (Gr. μερίς,

meris, portion). mer'istem, dividing tissue.

mers-, L. *mergo (mersum),* plunge, dip. emer'gent, rising up; mergan'ser (diving + L. *anser,* goose).

mes-, Gr. μέσος, *mesos,* middle. mes'oderm, middle tissue; mesogle'a; mes'entery, mid intestine; mesotho'rax, middle chest; Mesozo'ic, secondary animal period.

met-, meta-, Gr. μετά, *meta,* after, beyond. *meta*b'olism, after change; *met'*amere; *met'a*plasm, later substance; *Meta*zo'a, later animals; *meth*'od (Gr. μέθοδος, *methodos,* following after).

metr-, Gr. μέτρον, *metron,* measure. biom'etry, life measure; cen'timeter, by hundreds measure; diam'eter, across marker; microm'eter; sym'metry.

mi-, Gr. μείων, *meiōn,* less. Mi'ocene, less recent period.

micro-, Gr. μικρός, *mikros,* small. mi'crogamete, small gamete; micronu'cleus; mi'cropyle, small gate; mi'crotome, thin cutter.

midge, AS. *mycge* (<L. *musca*), fly.

migr-, L. *migro,* move. immigra'tion, in moving; mi'gratory; rem'igrant.

mildew, AS. *meledeaw,* honey-dew (<L. *mel,* Gr. μέλι, *meli,* honey), *i.e.* honey-dew becomes a culture medium for mildew.

milk, AS. *meolc,* milk. milkweed.

mill-, L. *mille,* thousand. mil'foil (L. *millefolium,* thousand leaf); mil'limeter, by thousands measure; mil'liped, thousand legs.

mim-, L. *mīmos,* Gr. μῖμος, *mīmos,* imitator, actor. mime'tic or mimet'ic (Gr. μιμητικός, *mīmētikos);* mim'icry; mi'motype, imitating a standard.

min-, L. *minuo,* make smaller (L. *minor,* small; *minus,* less; *minimum,* least). com'minute; dimin'ish; minute' (L. *minūtus,* little, unimportant).

miracid-, Gr. μεῖραξ, *meirax,* boy or girl. mīracid'ium, larval flukeworm.

miss-, mitt-, L. *mitto (missum),* send, let go. com'missure, together send; intromit'tent, into sending; transmis'sion.

mistletoe, AS. *ac-mistel-tan,* oak mistle twig; AS. *mistel,*

gluey (from the sticky berries).

mito-, Gr. μίτος, *mitos,* thread. mitochon'dria, thread granules; mito'sis, filled with spindle fibres.

mitr-, Gr. μίτρα, *mitra,* girdle. mi'tral.

mix-, Gr. μῖξις, *mixis,* mingling, mixing. amphimix'is, both mingling; endomix'is, within mixing; mixotroph'ic, combined nutrition.

mod-, L. *mŏdus,* measure, manner, rule. mode; mod'el; mod'ern; mod'ify; mod'ulate; mood.

molar, L. *mŏlāris,* of a mill, grinder (<L. *mŏla,* meal). mol'ecule, small grain (see p. 28).

mole, abb. of ME. *moldwarp,* earth-warper (<AS. *molde,* dirt, + *weorpan,* throw).

moll-, L. *mollis,* soft, pliant. Mollus'ca, soft bodied.

molt, moult, see *mūl-*.

mon-, Gr. μόνος, *monos,* single; μόνας (μοναδ-), *monas (monad-),* unit. mon'ad or mo'nad; mone'cious, one house; mo'nism; monocotyle'don.

mongoos, E. Ind. *mangus.*

monil-, L. *mŏnīle,* string of beads. monil'iform, necklace like.

monitor, L. *mŏnĭtor,* one who warns.

monkey, O. Ital. *monicchio,* monkey.

moose, Am. Ind. *moos* or *musu,* foliage stripper.

mor-, Gr. μωρός, *mōros,* stupid, foolish. (Cf. sophomore < Gr. σοφομώρος, *sophomōros,* foolishly wise.) mo'ron.

mores, L. *mores,* customs, behavior (sing. *mos*). intermo'res; mo'res.

morgan, < Thomas Hunt Morgan, American zoologist (b. 1866). mor'gan (genetics unit of measure).

morph-, Gr. μορφή, *morphē,* form, shape. dimorph'ism; metamorpho'sis, different forms; morphol'ogy, form study.

morula, L. *mōrula* (Gr. μῶρον, *mōron,* mulberry), mulberry.

mosaic, Gr. μουσεῖον, *mouseion,* temple of Muses, hence museum (see p. 13).

moss, AS. *meos,* moss; *mos,* bog. clubmoss; moss.

moth, AS. *moththe.*

mouse, AS. *mūs,* L. *mūs,* Gr. μῦς, *mūs,* mouse.

mouth, AS. *mūth,* mouth. mouth'parts.

mov-, mot-, L. *mŏvĕo (mōtum),* move. emo′tion; locomo′-tion; mo′bile; mo′tile; mo′tor; move′ment.

muc-, L. *muceo,* be moldy (L. *mūcus,* slime). muck; mu′-cilage, moldy juice; Mu′cor (bread mold); muco′sa, mucous membrane; mu′cus.

mucr-, L. *mūcro,* sharp point. mu′cronate.

mulberry, AS. *mor-beam,* mulberry tree; *mor-berry,* its fruit (L. *mōrus,* Gr. μῶρον, *mōron,* mulberry tree).

mule, AS. *mul,* L. *mūlus,* mule hybrid (<Gr. μύκλος, *muklos,* ass). mulat′to, mixed breed.

muls-, L. *mulgĕo (mulctum),* milk; L. *mulceo (mulsum),* stroke. emul′sion.

mult-, L. *multus,* much, many. multicel′lular; multimo′-dal; multipo′lar; mul′tiply, many times.

muric-, L. *mūrex, (mūric-),* (1) a spiny rock snail which furnished purple dye; (2) pointed stone, shaped like the mollusc. mu′ricate (L. *muricātus,* pointed).

musc-, L. *musca,* fly. mosqui′to, little fly (Span.); Muscidæ, fly family.

musc-, L. *muscus,* moss. Mus′ci, mosses.

musc-, L. *musculus,* muscle, sinew (dim. of L. *mūs,* Gr. μῦς, *mūs,* mouse). mus′cular.

mushroom, OF. *mouschron* (<OF. *mousse,* L. *muscus,* moss).

musk, Fr. *musc,* musk-deer (<Gr. μόσχος, *moschos,* calf < Skr. *mushka,* testicle). musk-deer; musk-ox; musk-rat (Am. Ind. *muskquessu,* red rat).

mussel, AS. *muxle,* a bivalve mollusc.

mut-, L. *mūto,* change. moult; mu′table; mu′tant; muta′-tion; permuta′tion.

mycet-, Gr. μύκης (μυκητ-), *mykēs (mykēt-),* fungus. myce′lium (Gr. ἧλος, *hēlos,* peg); Mycetozo′a, fungus animals; mycol′ogy, fungus science.

myel-, Gr. μυελός, *myelos,* marrow, core. my′elin; my′elocyte, marrow cell.

myo-, Gr. μῦς, *mūs,* muscle. myogen′ic, muscle origin; myog′-raphy, muscle mapping; my′otome, muscle section; perimys′ium, surrounding a muscle.

myri-, Gr. μυρίος, *myrios,* countless (10,000). myr′iad; Myri-

ap'oda, countless legs.

myrmec-, Gr. μύρμηξ, *myrmēx,* ant (<root MUR, swarm, cf. myriad, Myrmidon, L. *myrmīca,* ant, and ME. *pis-se-mī-re,* urinous ant). myr'mecophile, ant lover; Myrme'-leon, ant lion.

mysis, Gr. μύσις, *mysis,* a closing (<Gr. μύω, *muō,* shut). My'-sis (opossum shrimp).

mystax, Gr. μύσταξ, *mystax,* upper lip. Mystacoce'ti, whale-bone whales. (Mem. mustache.)

Mytilus, L. *mītulus,* Gr. μιτύλος, *mitylos,* edible mussel.

myx-, Gr. μύξα, *myxă,* slime, mucus. Myxi'ne, slime-eel (hag fish); Myxomyce'tes, slime fungi.

myz-, Gr. μύζον, *myzon,* sucker. Petromy'zon, stone sucker (lamprey).

N

nacre, Fr. *nacre,* mother-of-pearl. na'cre.

naiad, L. *Nāïăs (Nāïăd-),* water nymph; Gr. ναϊάς, *naïas,* swimmer. na'iad.

narc-, Gr. νάρκη, *narkē,* numbness, stupor. Narcis'sus; nar-comedu'sa; narcot'ic.

nares, L. *nāris,* nostril. na'rial.

nast-, Gr. νάσσω, *nassō,* close up. nas'tic; nyctinas'tic, night closing; thermonas'tic, heat closing.

nasturtium, L. *nasturcium,* cress, lit. nose twister, *i.e.* pun-gent (<L. *nāsus,* nose, + *turc-,* twist).

nasus, L. *nāsus,* nose. na'sal; nasofron'tal, nose forehead; na'sute.

nat-, L. *nascor (nātus),* be born. adna'tion; adnas'cence; con'nate, together arising; nas'cent, springing forth; na'-tion (L. *nātio,* people); na'tive (L. *nātīvus,* inborn); na'-ture (L. *nātūra*); prena'tal, before birth.

nat-, L. *nato,* swim. na'tant, swimming; Natan'tia; natato'-rial.

nau-, Gr. ναῦς, *naus,* ναύτης, *nautēs,* ship. Argonau'ta, Argo

sailor; nau'plius (L.); nau'sea (L.); Nau'tilus (Gr. ναυτίλος, *nautilos,* sailor).

nav-, L. *nāvicula,* little boat (<L. *nāvis,* ship). navic'ular.

navel, AS. *nafela,* navel.

Necator, NL. *necātor,* slayer (<L. *nĕco,* kill).

neck, AS. *hnecca,* neck.

necro-, Gr. νεκρός, *nekros,* dead body. necro'sis.

nect-, L. *necto (nexum),* bind. annec'tant; connec'tive, together fastened.

nectar, Gr. νέκταρ, *nektar,* drink of the gods. nectarif'erous, nectar bearing; nec'tary.

necto-, Gr. νήχω, *nēchō,* swim. nec'ton or nek'ton; Nectu'-rus, swim tail.

nemat-, Gr. νῆμα (νηματ-), *nēma (nēmat-),* thread. Nemathelmin'thes, thread worms; nem'atocyst, thread bag; Nemato'da, thread like.

nemert-, Gr. Νημερτής, *Nēmertēs,* a nymph, lit. unfailing. Nemerte'a.

neo-, Gr. νέος, *neos,* new, young. Nearc'tic; Neo-Dar'winism; Neogæ'a; neolith'ic, new stone; neote'nia, youth prolonged.

nephr-, Gr. νεφρός, *nephros,* kidney. metaneph'ros (pl. metaneph'roi); nephrid'ium; neph'rostome, kidney opening.

Nereis, Gr. Νηρεΐς, *Nēreïs,* sea nymph (<Gr. νηρός, *nēros,* wet; cf. *aneroid,* a barometer without liquid). Ne'reis.

nerv-, L. *nervus,* nerve, sinew. innerva'tion; nerve.

neur-, Gr. νεῦρον, *neuron,* nerve. neu'rocœle, nerve cavity; neurogli'a; Neurop'tera, nerve winged (insects).

neuter, L. *neuter,* neither of the two. neu'ter; neu'tralize; neu'tron; neu'trophile.

newt, ME. an *ewt* (<AS. *efeta,* eft).

nex-, L. *nexio,* binding (see *nect-*). annex; connex'ion, revised spelling for connection.

nict-, L. *nicto,* wink. nic'tate; nictita'ting.

nid-, L. *nīdus,* nest. nidifica'tion.

nitr-, L. *nitrum,* KNO_3 (<Gr. νίτρον, *nitron* < Ar. *nitrun,* soda). ni'trate; ni'trogen.

noct-, L. *nox (noct-),* night (<Gr. νύξ, *nyx*). Noctilu'ca, night light; noctiv'agant, night roaming; noctur'nal.

nodus, L. *nōdus,* knot, knob. in'ternode, between nodes; node; no'dose (L. *nōdōsus,* full of knots); nod'ule (dim.).
nom-, L. *nōmen (nomin-),* name (cf. *onoma*). bino'mial; innom'inate, unnamed; nomencla'ture, name calling, (see p. 27) (L. *calo,* call).
nom-, Gr. νόμος, *nomos,* law, management. bionom'ics, life adaptations; econ'omy, household management; heteron'omous, different law; homon'omous, same law.
non-, L. *non,* not (<L. *ne,* not, + *unum,* one). non-assimila'tion; non-fossilif'erous; non-tox'ic.
nose, AS. *nosu,* nose. nos'tril (AS. *nosu* + *thril,* hole).
noto-, Gr. νότος, *notos,* south. Notogæ'a, southern world.
notum, Gr. νῶτον, *nōton,* back. no'tochord, back chord; notopo'dium, dorsal leg.
nuc-, L. *nux (nucis),* nut. enu'cleate; nucel'lus, little nut; nucle'olus; nu'cleus, kernel.
nucha, Ar. *nucha,* back of neck. nu'chal.
nud-, L. *nūdus,* naked. Nudibranchia'ta, bare gill molluscs.
numm-, L. *nummus,* coin. num'mulite, little coin fossil.
nut, AS. *hnutu,* nut. chest'nut; co'conut; wal'nut.
nutat-, L. *nutatio* (<L. *nuto,* move up and down), a nodding. nuta'tion.
nutr-, L. *nūtrio,* nourish. nurse (L. *nūtrix* > Fr. *nourrice*); nur'ture; nu'triment (L. *nūtrīmentum*); nutrit'ion.
nyct-, Gr. νύξ (νυκτ-), *nyx (nykt-),* night. nyctinas'tic, night closing (flowers).
-nym, see *onom-*.
nymph, Gr. νύμφη, *nymphē,* bride, maiden, nymph. nym'phal.

O

oak, AS. *āc.*
oat, AS. *āte.*
ob-, L. *ob (o-, oc-, of-, op-),* against, in the way, out, in-

verted. omis'sion: *ob*cor'date; *ob*lique'; *ob*'ject; *obo'*-vate: *oc*'cupy; *oc*cur'rence: *of*fen'sive: *op*'posite; *op*press.

Obelia, Gr. ὀβελός, *obelos,* a spit, tapering pillar. Obe'lia.

occiput, L. *occiput,* back of head. occip'ital.

oceano-, Gr. ὠκεανός, *ōkeanos,* ocean. oceanograph'ic, ocean recording.

ocellus, L. *ocellus,* little eye (dim. of *oculus*). oc'ellated; ocel'liform.

oct-, Gr. ὀκτώ, *oktō,* eight. octam'erous, eight parted; octo-pet'alous; oc'toploid, eight times; oc'topod; oc'topus or Octo'pus, eight legged.

ocul-, L. *ŏcŭlus,* eye, bud or eye of a plant. bĭnoc'ular, for two eyes; inoc'ulate, inbudding.

od-, hod-, Gr. ὁδός, *hodos,* way, system. an'ode, up way; cath'-ode, down way; elec'trode, current path; ex'odus; meth'-od, further system (Gr. μέθοδος, *methodos;* μετά + ὁδός); period, around way (Gr. περί-οδος, *peri-odos,* cycle, circuit); periodic'ity.

odont-, Gr. ὀδούς, *odous,* tooth. cy'nodont, dog toothed (early reptiles); mas'todon, nipple toothed; Odona'ta, toothed (dragon-flies).

œc-, ec-, Gr. οἶκος, *oikos,* house. diœ'cious, separate houses; ecol'ogy, environment study; econ'omy, household management (Gr. οἰκόνομος, *oikonomos,* housekeeper, steward); monœ'cious, single house.

œd-, ed-, Gr. οἶδος, *oidos,* swelling. ede'ma; œd'agus; Œdogo'-nium, swollen reproducing cell.

œn-, Gr. οἶνος, *oinos,* wine. œ'nocytes, *i.e.* cells suggesting grape cluster; Œnothe'ra (Gr. θήρα, *thēra,* hunt).

œs-, Gr. οἴσω, *oisō,* will bear. œsoph'agus, carrying food.

œstr-, Gr. οἶστρος, *oistros,* gadfly, goad, frenzy. Œs'tridæ, bot-fly family; œs'trin; œs'trum; œs'trus, periodic sexual excitement.

offic-, L. *officīna,* workshop, laboratory (<L. *opus,* work, + *facio,* do). offici'nal or offic'inal.

-oid, Gr. εἶδος, *eidos,* form, shape. o'void; mas'toid, nipple shaped; Plasmo'dium, moulded form; rhi'zoid, root-like; sphe'roid.

olfact-, L. *olfacio,* smell. olfac'tory.

olig-, Gr. ὀλίγος, *oligos,* few, small. Ol′igocene, rather recent; Oligochæ′ta, few bristles; oligogen′esis, few lines of descent.

olive, L. *ŏlīva,* olive.

omasum, L. *omāsum,* paunch. aboma′sum; oma′sum, manyplies.

omentum, L. *ōmentum,* bowels, fat-skin.

ommatidium, Gr. ὄμμα (ὀμματ-), *omma (ommat-),* eye. ommatid′ia (pl.).

omni-, L. *omnis,* all. omniv′orous, all eating.

omphal-, Gr. ὀμφαλός, *omphalos,* navel. omphal′ic; omphalo-mesenter′ic.

onch-, Gr. ὄγκος, *onkos,* barb (see *onych-*). onchocerci′asis; on′chosphere.

onion, Fr. *oignon* <L. *unio,* large pearl, onion (see p. 5).

onom-, onym-, Gr. ὄνομα, *onoma;* ὄνυμα, *onyma,* name. (See *nom-.*) hom′onym, same name; patronym′ic, father's name; syn′onym.

onto-, Gr. ὤν, *ōn,* being (part. of εἰμί, *eimi,* be, exist); τά ὄντα, *ta onta,* existing things. hap′lont, single state; ontog′eny. individual development; Palæontol′ogy, science of ancient descent.

onych-, Gr. ὄνυξ (ὀνυχ-), *onyx (onych-),* talon, claw. onych′ium; Onychoph′ora, claw bearer.

oo-, Gr. ᾠόν, *ōon,* egg. o′ocyte, egg cell; oogen′esis, egg formation.

operculum, L. *operculum,* lid, cover. oper′cula (pl.).

ophi-, Gr. ὄφις, *ophĭs,* snake. Ophid′ia, snake like; Ophiuroi′dea, snake tail like (serpent starfish).

ophthalm-, Gr. ὀφθαλμός, *ophthalmos,* eye. ophthal′mic.

opisth-, Gr. ὄπισθε, *opisthe,* behind. opisthocœ′lous, behind hollowed; opisthogo′neate, posterior genitalia; opisthot′ic, behind ear.

opossum, N. Am. Ind. *opassum.*

ops-, Gr. ὄψις, *opsis,* appearance. Ichthyop′sida, fish appearance.

ops-, Gr. ὤψ (ὠπ-), *ōps (ōp-),* eye, face. an′telope (<Gr. ἄνθολοψ, *antholops,* bright eye); Cy′clops, round eye; Tricer′atops, three horned face.

opsonin, Gr. ὄψον, *opson,* sauce, seasoning. opson′ic.

opt-, Gr. ὀπτήρ, *optēr,* spy (<Gr. ὄψομαι, *opsomai,* shall see). diop′tric, through seeing; op′tics.

or-, os-, L. *ōs, (ōris),* mouth. abo′ral, opposite mouth; os′culum, little mouth; or′ifice (L. *facio,* make).

orang-outan, Malay *orang,* man, + *utan,* forest.

orb-, L. *orbis,* ring, circle, disk, eye-socket. orbic′ular (L. *orbiculus,* little disk); or′bit (L. *orbĭta,* wheel-rut); supraor′bital, above eye-socket.

orch-, Gr. ὄρχις, *orchis,* testicle. mesor′chium; or′chid, testicle-shaped roots.

orchard, AS. *orceard* > *ortgeard,* i.e. *wort yard,* plant garden.

ord-, L. *ordo (ordin-),* series, line, order. or′der; or′dinal.

Ordovician, <L. *Ordovīces,* Celtic inhabitants of Wales.

organ, Gr. ὄργανον, *orgănon,* organ, tool, instrument. organel′la; or′ganism; organog′eny, organ development.

ori-, orig-, L. *ŏrĭor (ortus),* rise, spring. abor′tion, come forth; or′ient (L. *oriens,* rising [sun], *i.e.* east); orienta′tion; or′igin (L. *orīgo, originis,* source).

oriole, OF. *oriol* (<L. *aureolus,* golden).

ornith-, Gr. ὄρνις (ὀρνιθ-), *ornis (ornith-),* bird. Neor′nithes, recent birds; ornithol′ogy, bird science.

oro-, Gr. ὄρος, *oros,* mountain. orog′eny, mountain production; Orohip′pus, mountain horse.

ortho-, Gr. ὀρθός, *orthos,* straight. orthogen′esis, straight evolution; Orthop′tera, straight winged (grasshoppers).

os, see *or-* and *oss-*.

oscill-, L. *oscillo,* swing. Oscillato′ria.

-osis, L. *-ōsis,* Gr. -ωσις, *-ōsis,* suffix indicating (1) parasitized condition (see *-iasis*); (2) physiological process or state. (1) trichino′sis; tuberculo′sis; (2) metamorpho′sis or metamor′phosis; mito′sis; osmo′sis; phagocyto′sis.

osm-, Gr. ὀσμή, *osmē,* smell. osmate′rium.

osmosis, Gr. ὦσμος, *ōsmos,* pushing (<Gr. ὤσω ōsō, fut. of ὠθέω, *ōtheō,* thrust, push). exosmo′sis, out pushing; osmot′ic.

osphr-, Gr. ὀσφράδιον, *osphradion,* strong smell. osphra′dium.

osprey, L. *ossifragus,* sea-eagle or osprey (<L. *ŏs,* bone, +

frango, break).

oss-, L. *osseus,* bony (<L. *ŏs, ossis,* bone). os'seous; os'sicle (dim.); os'sify, bone making.

oste-, Gr. ὀστέον, *osteon,* bone. osteogenet'ic, bone forming; osteol'ogy, bone study; perios'teum, surrounding bone; Teleos'tei, completely bony (fishes).

ostium, L. *ostium,* door (<L. *ōs,* mouth). os'tia (pl.); os'tiole (dim.).

ostrac-, Gr. ὄστρακον, *ostrăkon,* shell. os'tracism (see p. 27); Ostrac'oda, shell like; os'tracoderm, shell skin; Os'trea (Gr. ὄστρεον, *ostreon*), oyster.

ostrich, Fr. *autruche* (<L. *avis strūthio,* Gr. στρουθίων, *strouthiōn*), ostrich.

ot- Gr. οὖς (ὠτός), *ous (ōtos),* ear. o'tic; o'tocyst, ear sac; o'tolith, ear stone; paro'tid or parot'id.

ovum, L. *ovum,* egg (*ovulum,* dim.). obo'vate, reversed egg shaped; o'vary; o'vate; o'viduct, egg conveyer; ovip'arous, egg producing; ovipos'itor, egg placer; ovulif'erous, ovule bearing.

owl, AS. *ūle* (<L. *ŭlŭla,* owl < L. *ŭlŭlo,* howl). howler (*h* added for emphasis); owlet.

ox, AS. oxa (<Skr. *uksan,* bull, lit. dribbler).

ox-, Gr. ὀξύς, *oxys,* sharp, pointed. Amphiox'us, both ends pointed; ox'alis (Gr. ὀξαλίς, *oxalis,* sorrel, *q.v.*); oxychro'matin, acid pigment; ox'ygen, acid former; par'oxysm, acute stage.

oyster, <Gr. ὄστρεον, *ostreon,* oyster (cf. Gr. ὀστέον, *osteon,* bone and ὄστρακον, *ostrakon,* shell).

P

pachy-, Gr. παχύς, *pachys,* thick. pach'yderm, thick skin; pachyp'terous, thick wing.

pædo-, pedo-, Gr. παῖς (παιδ-) *pais (paid-),* child. ped'agogy (see p. 38); pædogen'esis, child reproduction.

pag-, L. *pango,* LL. *pāgo,* fix, fasten, drive in (cf. *propago*).

impale; page (L. *pāgĭna*).

pal-, L. *pālus,* stake, pole. palisade (Fr.), close fence of stakes.

palæ-, Gr. παλαιός, *palaios,* old, ancient. pal'æolith or pa'leolith, old stone; palæontol'ogy; palæozo'ic.

palat-, L. *palātum,* palate. pal'atable; pal'atine; palato-max'illary.

palea, L. *pălea,* chaff. pa'lea.

palin-, Gr. πάλιν, *palin,* back, once more. palingen'esis, again generation. (See *palimpsest,* p. 40.)

pall-, L. *palla, pallium,* mantle. pal'lial.

palm, L. *palma,* palm of hand; palm-tree; Gr. παλάμη, *palamē,* palm of hand. pal'mate; palmet'to.

palp-, L. *palpo,* touch gently. pal'pitate; pal'pus; ped'ipalp.

palu-, L. *pălus,* swamp. paludic'olous, swamp dwelling; palus'trine (L. *paluster,* marshy).

pan-, Gr. πᾶς, πᾶν, *pas, pan,* all. pan'creas, all flesh; pande'mic (Gr. δῆμος, *dēmos,* the people); Pandori'na, all giver; pangen'esis; pan'ther (Gr. θήρ, *thēr,* animal).

pan-, L. *pānis,* bread (<L. *panicum,* panic-grass). compan'ion.

pan-, L. *panus,* web (<Gr. πήνη, *pēnē,* thread on a shuttle). pan'icle; panic'ulate.

pansy, Fr. *pensée,* pansy (<L. *penso,* think, ponder), from meditative appearance of flower.

papilio, L. *papilio (papiliōn-),* butterfly. papiliona'ceous.

papilla, L. *papilla,* nipple. papil'læ (pl.); papil'liform; pap'illose.

pappus, Gr. πάππος, *pappos,* down. pap'pose.

par-, L. *pareo (paritum),* appear. appar'ent; transpar'ent.

par-, L. *părio (part-),* produce, bring forth. bip'arous; ovip'arous, egg laying; par'ent; vivip'arous, alive bearing.

par-, L. *păro (paratum),* make ready. appara'tus; sep'arate; sev'er.

para-, Gr. παρά, *para,* beside. *para*ly'zer; *para*nu'cleus; *par*aph'ysis; *para*po'dium; *par'a*site (Gr. παράσιτος, *parasitos,* eating at another's table).

parietal, <L. *parĭes,* wall. parietosquamo'sal.

parrot, <Fr. *Perro,* dim. of *Pierre,* Peter, *i.e.* Little Peter's

bird. (See petrel.)

parsley, <Fr. *persil,* parsley (<L. *petroselinum,* Gr. πετροσέλινον, *petroselinon,* rock parsley).

part-, L. *partio (partītus),* divide; *pars,* part. bipar′tite; part′icle; partit′ion.

parthen-, Gr. παρθένος, *parthenos,* virgin. parthenogen′esis, virgin birth.

partridge, L. *perdix,* Gr. πέρδιξ, *perdix,* partridge.

partur-, L. *parturio,* desire to reproduce. parturit′ion.

pat-, L. *patior (passus),* suffer, endure. compat′ible (L. *patibilis,* endurable, sensitive); pas′sive; pa′tience; pa′tient.

pat-, Gr. πάτος, *patos,* path. Perip′atus, around walker.

pat-, L. *pateo,* lie open. patel′la (dim. of L. *pătĕra,* dish); patel′liform; pa′tent.

patagium, L. *patāgium,* border of a garment.

pater-, L. *pater,* father. pater′nal (L. *paternus,* relating to a father).

path-, Gr. πάθος, *pathos,* suffering, feeling. ap′athy; pathogen′ic, disease producer; pathol′ogy, disease science; sympathet′ic, together feeling.

pauro-, Gr. παῦρος, *pauros,* little, brief. Paurometab′ola, little change.

pause, Gr. παύσω, *pausō,* stop. di′apause, cease utterly.

peach, Fr. *peche* (<L. *persicum, i.e.* Persian fruit). peach-borer.

peacock, AS. *pāwa,* peacock + cock (<L. *pavo,* Gr. ταῶς, *taōs,* peacock).

pear, L. *pĭrum,* pear; *pĭrus,* pear-tree. pearl (dim.).

peccary, S. Am. > Span. *pecari.*

pecten, L. *pecten,* comb. pec′tinal; pec′tinate.

pectus, L. *pectus,* breast, breastbone. expec′torate; pec′toral.

ped-, L. *pēs (ped-),* foot. bi′ped; cen′tipede, hundred feet; ped′al; ped′estal, footstool; ped′icel (dim.); pedicella′ria; ped′ipalp; pedun′cle (LL. *pedunculus,* dim.); Pinnipe′dia, fin feet; quad′ruped.

pedesis, Gr. πηδάω, *pēdaō,* leap, throb, heartbeat. diapede′sis, throbbing through.

pelag-, L. *pelagus,* Gr. πέλαγος, *pelagos,* open sea. pel′agic or pela′gic.

pelage, Fr. *pelage,* fur (<L. *pilus,* hair). pel'age.
pelec-, Gr. πέλεκυς *pelekys,* hatchet. Pelecyp'oda, hatchet footed (clams).
pelican, Gr. πελεκάν, *pelekan,* pelican (<Gr. πέλεκυς, *pelekys,* axe), from shape of bill.
pell-, L. *pellis,* hide, skin. peel; pel'licle (dim.).
pelmat-, Gr. πέλμα, *pelma,* sole of foot. Pelmatozo'a, stalked animals.
pelor-, Gr. πέλωρ, *pelōr,* monster. pelo'ria; pelo'ric.
pelt-, Gr. πέλτη, *peltē,* crescent-shaped shield. pel'tate.
pelvis, L. *pelvis,* basin. pel'ves (pl.); pel'vic.
pend-, L. *pendeo,* hang. appen'dage, on hang; appen'dix; suspen'sion.
penetr-, L. *penetro,* pass through. penetrabil'ity.
penguin, ME. *penguin,* the great auk (<W. *pen,* head, + *gwyn,* white), see p. 21.
penicill-, L. *penicillum,* paint-brush. pen'cil; penicil'late; Penicil'lium.
penis, L. *penis,* tail. pe'nes (pl.).
penn-, L. *penna,* feather, wing. bipen'nate.
penta, Gr. πέντε, *pente,* five. pentadac'tyl, five fingered; pentam'erous; pen'taploid; pentasep'alous.
pepo, L. *pēpo,* melon. pe'po.
pepsin, < Gr. πέσσω, *pessō,* πέπτω, *peptō,* cook, digest. pep'tic; pep'tone.
per-, L. *per (pel-),* through, thoroughly. *per*spire; sense-*per*ception; zo'na *pel*lu'cida, through light.
perch, L. *perca,* the fish (<Gr. πέρκος, *perkos,* spotted).
perenni-, L. *perennis,* lasting through the year (L. *per* + *annus,* year). peren'nial; peren'nibranch.
peri, Gr. περί, *peri,* around. *per'i*anth, around flower; *peri*car'dium; *per'i*cycle; *Perip*'atus, around walking; *per'i*stome, around mouth.
peri-, L. *perior (peritus),* try. expe'rience; exper'iment; ex'pert.
periss-, Gr. περισσός, *perissos,* uneven number. Perissodac'tyl, odd toed.
peritonæum, LL. *peritonæum* (<Gr. περι-τείνω, *peri-teinō,* stretch all around). peritone'al.

Perm, Perm, former province of Russia. Per'mian.
pet-, L. *pĕto,* go toward. centrip'etal, center seeking.
petal, Gr. πέταλον, *petalon,* leaf. apet'alous; pet'al.
petiole, L. *petiolus, pediolus,* fruit stalk. pet'iole.
petr-, L. *petra,* Gr. πέτρα, *petra,* rock. pet'rify, rock make (L.); Petromy'zon, rock sucker (Gr.).
petrel, Fr. *pétrel,* little Peter (*i.e.* appearing to walk on water like St. Peter). (See parrot.)
phæ-, Gr. φαιός, *phaios,* dusky, brown. Phæophy'ceæ, brown algæ.
phag-, Gr. φαγεῖν, *phagein,* eat, devour. bacte'riophage; œsoph'agus; phag'ocyte, eating cell; phytoph'agous, plant eating; vitel'lophag, yolk eater.
phalang-, Gr. φάλαγξ, *phalanx,* fingerbone; φαλάγγιον, *phalangion,* long-legged spider. phalan'ges, finger bones; Phalan'gida (order of "daddy long-legs").
phaner-, Gr. φανερός, *phaneros,* visible, manifest. Phan'erogam, visible marriage.
pharynx, Gr. φάρυγξ, *pharynx,* throat. pharyn'geal.
phase, Gr. φάσις, *phasis,* appearance (<φαίνω, *phainō,* bring to light). met'aphase; pol'yphase; pro'phase.
pheasant, L. *phāsiānus,* pheasant < River Phasis.
phellem, Gr. φελλός, *phellos,* cork. phel'loderm; phel'logen, cork forming.
phen-, Gr. φαίνω, *phainō,* disclose, display, make clear, shine (cf. *phase*). phenog'amous; phe'nol, shining oil; phenom'enon, something seen; phe'notype, manifest kind.
pher-, Gr. φέρω, *pherō,* bear, carry (cf. *phor-*). periph'eral.
phil-, Gr. φίλος, *philos,* lover. hæmophil'ia, blood fondness; phil'trum; xeroph'ilous, desert loving.
phloem, Gr. φλοιός, *phloios,* inner bark of trees. phlo'em.
phor, Gr. φόρος, *phoros,* bearer (<Gr. φέρω, *pherō,* L. *fero,* bear). antherid'iophore; cataphore'sis; conid'iophore; periph'ery; phor'esie, carrying.
phoron-, L. *Phorōnis,* Gr. Φορωνίς, *Phorōnis,* Io. Phorōnid'ea.
phos-, phot-, Gr. φῶς (φωτ-), *phōs (phōt-),* contr. of φάος, *phaos,* light. phosphores'cent, light bearing; photosyn'thesis, light together arranging; photot'ropism, light turning.

phrad-, Gr. φραδής, *phradēs,* understanding, warning. osphra′dion, smell warner.

phragma, Gr. φράγμα, *phragma,* fence. di′aphragm, partition across; Phragmi′tes, reed grass; phrag′macone.

phren-, Gr. φρήν (φρένος,) *phrēn, phrenos,* diaphragm. phre′nic. (See p. 33.)

phrys-, Gr. φρύσσω, *phryssō,* broil (in sun). Actin′ophrys (sun animalcule).

phyc-, Gr. φῦκος, *phykos,* seaweed (cf. *Fucus*). Phæophy′ceæ, brown algæ; Phycomyce′tes, alga fungi.

phyl-, Gr. φῦλον, *phylon,* race. phylet′ic; phylog′eny, race development; phy′lum.

phylac-, Gr. φύλαξις, *phylaxis,* guarding. anaphylax′is; prophylax′is, before guard.

phyll-, Gr. φύλλον, *phyllon,* leaf. chlo′rophyll, green leaf; microphyl′lous; phyllo′dium, leaf-like; Phyllop′oda, leaf legs (fairy shrimp); phyllotax′is, leaf arrangement.

phys-, Gr. φῦσα, *physa,* bellows (<Gr. φυσάω, *physaō,* puff, blow). apoph′ysis, out-growth; paraph′yses; Physa′lia (Portuguese man-of-war); physogas′ter, inflated abdomen; sym′physis, fusion growth.

phys-, Gr. φύσις, *physis,* constitution, nature. physician; physiog′raphy; physiol′ogy, constitution study.

phyt-, Gr. φυτόν, *phyton,* plant. Bryoph′yta, moss plant; ep′iphyte; phy′tome, vegetation (Gr. ὁμοῦ, *homou,* in common, together); phytoph′agous, plant eater; sap′rophyte, decay plant; zo′ophyte.

pia, L. *pius,* pious, tender, delicate. *pi′a ma′ter,* delicate material.

pig, ME. *pigge.*

pigeon, < L. *pipio (pipion-),* a chirping bird.

pigment, L. *pigmentum,* pigment (<L. *pingo,* paint). pigmenta′tion.

pike, <L. *spīca,* point. pickerel (dim.).

pil-, L. *pĭlus,* hair. pile; pi′lose.

pileus, L. *pīleus,* Gr. πῖλος, *pilos,* tight-fitting felt cap. pilid′ium.

pin-, Gr. πίνω, *pinō,* drink up. pinocyto′sis, imbibing cell.

pinna, L. *pinna,* feather, fin. bipinna′ria; pen; pin; pin′ion; pin′nate; pinnat′ifid, cleft-like feather; Pinnipe′dia,

fin footed (seals).

pinus, L. *pīnus,* pine. pi′neal or pin′eal (L. *pīnea,* pine cone).

pisc-, L. *piscis,* fish. Pis′ces, fishes.

pistil, L. *pistillum,* pestle. pis′tillate.

pith, AS. *pitha,* pith.

pithec-, Gr. πίθηκος, *pithēkos,* ape. Dryopithe′cus, oak ape; Pithecanthro′pus, ape man.

pituit-, L. *pītuīta,* mucus (<L. *sputum*). pitu′itary or pit′-uitary.

plac-, Gr. πλακοῦς, *plakous,* flat cake. placen′ta (L. *placenta,* cake); Placenta′lia; plac′oid.

plagio-, Gr. πλάγιος, *plagios,* slanting, oblique. pla′giodont.

plan-, L. *plānus,* flat, level. Plana′ria; plan′ula.

plan-, L. *plănus,* vagrant; Gr. πλάνος, *planos,* πλάνκτος, *planktos,* wandering, roaming about. planetes′imal; plank′ton; plan′oblast.

plant, L. *planta,* a cutting, graft of a plant (<Gr. πλατύς, *platys,* spreading, broad). implant′; planta′tion (L. *plantatio*, a planting); transplant′.

planta, L. *planta,* sole of foot. plan′tar; plan′tigrade, sole walker.

plasm-, Gr. πλάσμα, *plasma,* anything moulded. homop′lasy, formed alike; plasmo′dium; plasmol′ysis; pro′toplasm, first form; so′matoplasm.

plast-, Gr. πλαστός, *plastos,* moulded, formed. chlo′roplast, green form; chro′moplast, color form; plas′ter (L. *emplastrum*); plas′tic; plastic′ity; plas′tron.

platy-, Gr. πλατύς, *platys,* flat, wide. (Cf. place, plane, plate, plateau, platform.) platycne′mia, flat shin; Platyhelmin′-thes, flat worms; Plat′ypus, flat foot.

plec-, Gr. πλέκω, *plekō,* fold, twine; πλέκτω, *plektō,* intertwine. Plecop′tera, folded wings (stoneflies); Plectop′tera, wings interwoven with veins (dayflies).

pleist-, Gr. πλεῖστος, *pleistos,* very much. Plei′stocene, most recent.

pleo-, Gr. πλέω, *plēo,* swim. ple′opod, swimming foot.

plesi-, Gr. πλήσιος, *plēsios,* near, close to. plesiobio′sis, near living (*e.g.* compound nests of ants); Plesiosau′ria,

near lizard.

pleur-, Gr. πλευρά, *pleura,* rib, side. pleu′ra; pleu′robranch; so′matopleure, body side.

plex-, L. *plexus,* network (<Gr. πλέκω, *plekō,* fold together). amplex′us (L. *ambi-*), around twining; com′plex; du′plex, two-fold; Euplexop′tera, wings folded well (earwigs); plex′us. (See plec-.)

plica, L. *plĭco (plicāt-),* fold. multiplica′tion, many fold; pli′cate; pli′ers.

plio-, Gr. πλείων, *pleiōn,* more. Pli′ocene, more recent. Pliohip′pus.

-ploid, Gr. ἁπλόος, *haploos,* one-fold; διπλόος, *diploos,* double. dip′loid; hap′loid; polyploi′dy.

plum, <L. *prūnum,* plum. prune.

plum-, L. *plūma,* small, soft feather. plu′mage; plu′mate; plume; plu′mose, downy; plu′mule.

pluteus, L. *plūteus,* movable protecting shed, painter's easel. plu′teus.

pneum-, Gr. πνεῦμα, *pneuma,* air; πνεύμον, *pneumōn,* lung. Enteropneus′ta, gut breathing; pneu′matophore, air bearer; pneumogas′tric, lung belly.

pnoi, Gr. πνοή, *pnoē,* breath. Dip′noi, double breathing (lung fish).

pod-, Gr. πούς (ποδ-), *pous (pod-),* foot, leg. ap′odous, legless, Arthrop′oda, jointed legs; Brachiop′oda, arms and legs; dec′apod; empo′dium, on foot; endop′odite, within leg, hex′apod; pol′yp (Gr. πολύπους, *polypous,* many feet).

podex, L. *pōdex (podĭcis),* rump. po′dex.

pœcil-, poikil-, Gr. ποικίλος, *poikilos,* changeful, spotted. pœcilother′mic or poikilother′mic, changing temperature.

pol-, Celt. *pol,* head. pol′lard; polled; pol′liwog; tad′pole.

pol-, L. *pŏlus,* pole; Gr. πόλος, *polos,* pivot. bipo′lar; po′lar; polar′ity; po′locyte.

polecat, ME. *polcat,* poultry cat (<OF. *pole,* pullet, ∴ pullet + cat, *i.e.* chicken stealer).

Polian, <Giuseppe S. Poli, Italian biologist (1746-1825). Po′lian vesicle.

polit-, Gr. πολίτης, *politēs,* citizen. pol′ish (Gr. πόλις, *polis,*

city); tropicopol'itan, tropics inhabitant.

pollen, L. *pollen (pollin-),* flour. pollinif'erous; pol'linate; pollin'ium.

pollex, L. *pollex,* thumb.

poly-, Gr. πολύς, *polys,* many. polyan'dry, many males; polyba'sic; polyem'bryony, many embryos; pol'yp (abbrev. of Gr. πολύπους, *polypous,* many foot); polyphylet'ic; polyphyl'lous.

pome, L. *pōmum,* apple. poma'ceous; pom'egranate (L. *grānātum,* full of seeds); pomol'ogy.

poplar, L. *pōpulus,* poplar.

popul-, L. *pŏpulus,* people. popula'tion; public (L. *publicus,* contr. of *populicus*); publish (L. *publico,* make public).

poppy, AS. *popig* (<L. *papaver*).

por-, Gr. πόρος, *poros,* opening. blas'topore, germ pore; Porif'era, holes bearing (sponges); poros'ity.

porcupine, ME. *porkëpyn* (<OF. *porc espin* < L. *porcus,* pig + *spīna,* spine).

porpoise, OE. *porcpisce* (<L. *porcus,* pig + *piscis,* fish).

port-, L. *portio,* portion. por'tion; propor'tion.

porta, L. *porta,* gate. por'tal; transport.

posit-, L. *pōno (pŏsit-),* place, lay down. decompose; ovipos'itor, egg layer; repos'itory; transposit'ion.

post-, L. *post,* behind, after. postabdo'men; posta'nal; poste'rior (comp. of L. *postĕrus,* following after); poster'ity; postor'bital, behind orbit.

potam-, Gr. ποταμός, *potamos,* river. hippopot'amus, river horse; potam'ic; Potamoge'ton, river weed.

potato, Span. *patata* (<Haytian *batata*).

potent-, L. *pŏtens (potent-),* capable, powerful. poten'tial; prepo'tency.

poto-, L. *poto,* drink; Gr. ποτόν, *poton,* drinking water. potom'eter.

prawn, ME. prane (<L. *perna,* prawn, also leg of pork, from shape of prawn).

pre-, L. *præ,* before. *pre*'fix; *pre*forma'tion; *pre*hu'man; *pre*mature'; *pre*mo'lar, before molar; *preo*'ral; *pre*'puce (L. *præputium,* fore skin).

pred-, L. *præda,* booty. preda′ceous; preda′tor, plunderer; pred′atory; prey.

pregnan-, L. *pregnans,* with child. impreg′nate; preg′nancy.

press-, L. *premo (press-),* press. compres′sor; depressed; imprint (L. *imprimo,* into press); pres′sure.

preter-, L. *præter,* beyond, past. preternat′ural.

prim-, L. *primus,* first. pri′mary; Pri′mates, foremost; prime′val; prim′itive; primor′dial, first beginning; prim′rose (L. *prīma,* early spring); prin′cipal; prin′ciple.

prior, L. *prior,* former (see *primus*). prior′ity.

pro-, (1) L. *pro (prod-);* (2) Gr. πρό, *pro,* before, forward, far. (1) *proc*′ess, pl. *proc*′essēs; *prod*′igal; *pro*tec′tion; (2) *prog*′nathous; *pro*neph′ros, early kidney; *pro*sto′mium, in front of mouth; *pro*thal′lus, in lieu of thallus; *pro*tho′rax, forward thorax.

proct-, Gr. πρωκτός, *prōktos,* anus. per′iproct; proctodæ′um, anus separate.

prol-, L. *prōles,* offspring. prolif′ic, young (or fruit) producing.

pron-, L. *prōnus,* face downward. prona′tor; prone.

propag-, L. *propāgo,* branch, offspring. prop′agate.

pros-, Gr. πρός, *pros,* from, near, against, toward, before. *pros*enceph′alon, fore brain; *pros′o*pyle.

prostate, Gr. προστάτης, *prostatēs,* guardian. pros′tate.

prot-, Gr. πρῶτος, *prōtos,* first. pro′tein; protone′ma, first thread; pro′toplasm, first formed; Protothe′ria, first beasts (Monotremes); Protozo′a, first animals.

proter-, Gr. πρότερος, *proteros,* former, before, earlier. pro′terandry; proterog′yny; Proterozo′ic.

prox-, L. *proximus,* nearest. prox′imal (opp. distal); proxim′ity.

psalterium, L. *psaltērium,* book of prayers. psalte′rium, the manyplies.

pseud-, Gr. ψευδής, *pseudēs,* false. pseu′docœl, not true body cavity; pseu′dopod, false leg; pseudoscor′pion.

psych-, Gr. ψυχή, *psȳchē,* breath, soul, mind (see p. 10). psychol′ogy, mind study.

ptarmigan, Gael. *tarmachan.*

pter-, Gr. πτέρις, *pteris,* fern; πτερόν, *pteron,* wing, feather,

fin. archipteryg'ium; Dip'tera, two winged; Pteridoph'-yta, fern plants; Pterodac'tyl; Pterop'oda, fin footed.

ptil-, Gr. πτίλον, *ptilon,* feather. ptili'num; ptilo'sis.

ptomain, <Gr. πτῶμα, *ptōma,* corpse, fall. pto'ma-ine or pto'main; symp'tom.

pty-, Gr. πτύαλον, *ptyalon,* spittle. plasmop'tysis, protoplasm disgorged; pty'alin.

pty-, Gr. πτύον, *ptyon,* winnowing fan. ptyoc'rinous, winnow separate.

pubis, L. *pūbes,* grown up. pu'berty; pubes'cent (L. *pūbes,* downy hair); puber'ulent; pu'bic (referring to hairy region of lower abdomen); pu'bis (*i.e.* pubic bone).

pull-, L. *pullus,* chick, bud. poul'try; pul'let; pul'lulate (L. *pullulo,* sprout out).

pulm-, L. *pulmones,* lungs. pul'monary; Pulmona'ta.

puls-, L. *pello (pulsum),* push, beat. im'pulse; pul'sating vacuole; pulse; repel'lent; repul'sion.

pulvin-, L. *pulvīnus,* cushion. pulvil'lus (dim.), pad; pulvi'-nar.

pumpkin, <ME. *pompion* < OF. *pompon* < L. *pepon-,* melon (<Gr. πέπων, *pepōn,* ripe, mellow).

punct-, L. *pungo (punctum),* point, prick. punc'tate; punc'-ture; pun'gent.

pupa, L. *pūpa,* doll, girl. pu'pal; pupa'rium; pu'pil, little doll, also center of eye; Pupip'ara.

putamen, L. *putāmen,* nutshell. puta'men.

putr-, L. *pŭter (putris),* rotten. putrefac'tive, rot making; pu'trify.

pycn-, Gr. πυκνός, *pyknos,* dense, close, compact. pyc'nium; Pycnog'onum, compact organs; pyc'nospore.

pyg-, Gr. πυγή, *pygē,* rump. hypopyg'ium, beneath rump; pygid'ium (Gr. πυγίδιον, *pygidion,* narrow rump); py'-gostyle.

pygm-, Gr. πυγμή, *pygmē,* fist, distance from elbow to fist. pyg'my.

pyl-, Gr. πύλη, *pylē,* gate, entrance. mi'cropyle, little entrance; pylo'rus (Gr. πυλωρός, *pylōros,* gate keeper).

pyr-, Gr. πῦρ, *pyr,* fire. pyr'ethrum (Gr. πύρεθρον, *pyrethron,* a hot spicy plant).

pyr, L. *pĭrum, pȳrum,* pear. pyrid'ium; pyr'iform, pear-shaped.
pyren-, Gr. πυρήν, *pyrēn,* fruit-stone. pyre'noid, nutlet shape.
python, Gr. Πυθών, *Pythōn,* Delphi, hence huge serpent killed by Apollo at Delphi.

Q

quadr-, quat-, L. *quadrātus,* square (<L. *quattuor,* four). quad'rate; quad'ruplex, fourfold; Quadru'mana, four handed; quad'ruped, four footed; Quater'nary, fourth.
quail, OF. *quaille* (<D. *kwaken,* quack).
qualit-, L. *quālis,* of what sort? qualita'tive.
quant-, L. *quantus,* how great, how much? quan'tity; quantita'tive; quan'tum.
quir-, L. *quæro (quæsīt-),* search for. acquired.

R

rabbit, OE. *rabbit,* gnawer (<OF. *rabot,* carpenter's plane).
raccoon, Am. Ind. *arathcone,* raccoon.
racem-, L. *racēmus,* grape cluster. ra'ceme; race'mic; rac'emose; raisin.
rachis, See rhachis.
rad-, ras-, L. *rādo (rāsus),* scrape. abra'sion; erase'; rad'ula, scraper.
radic-, L. *rādix (rădīc-),* root. erad'icate, root out; rad'ical, from the root; rad'icle, rootlet; ra'dix, pl. radi'ces, rad'ices, or ra'dixes.
radish, <L. *rādix,* root.
radius, L. *rădius,* ray, staff, spoke. ra'dial; radia'le; Radia'ta; ra'dii (pl.); radioac'tive; Radiola'ria; ray.
ram-, L. *rāmus,* branch. bira'mous, two branched; ramifi-

ca'tion; ra'meal.

Rana, L. *rāna,* frog. Ranun'culus, little frog (hence plant growing with tadpoles).

Rangifer, NL. *rangifer,* reindeer (AS. *hrān,* reindeer + L. *fera,* wild).

raphe, Gr. ῥαφή, *rhaphē,* suture, seam. (For raphis, see rhaph-.) ra'phē, pl. ra'phai.

raptor-, L. *raptor,* plunderer. rapa'cious; rape; rapto'rial; rave.

rat, AS. *ræt.*

rat-, L. *ratio,* calculation; *rătus,* thinking (<L. *reor,* think). ra'tio; rational; ratiocina'tion; reason.

Ratitæ, <L. *ratis,* raft, *i.e.* not with keel. Rati'tæ, birds with flat sternum; rat'ite.

re-, L. *rĕ (rĕ-),* (1) back; (2) again. (1) *re*ac'tion, back drive; *re*cep'tor, back taker; *re*ver'sion, back turning; (2) *re*capitula'tion, again heading; *re*spira'tion, again breath.

resin, L. *resīna,* resin (<Gr. ῥέω, *rheō,* flow). resinif'erous.

reciproc-, L. *reciprŏcus* (L. *re* and *pro*), back and forth. recip'rocal.

rect-, L. *rectus,* straight (<L. *rego,* govern). erect'; irreg'ular; rec'tify; rectigrada'tion, straight movement; rec'trix, pl. rectri'ces, governing or steering (feathers); rec'tum; regula'tion; right.

redia, <Francesco Redi, Italian biologist (1626-1695).

regul-, L. *regulo,* govern. regular; regula'tion.

rem-, L. *rēmus,* oar. rem'iges (pl. < L. *remex,* oarsman).

ren-, L. *rēnes,* kidneys. adre'nal, on kidneys; re'nal.

rept-, L. *rēpo (reptum),* creep. Reptan'tia; Reptil'ia, creepers.

ret-, L. *rētĕ,* net. retic'ulum, little net; ret'ina.

retro-, L. *retrō-,* backward. ret'rograde, backward step; retrorse (<L. *retroversus,* turned back).

rhabd-, Gr. ῥάβδος, *rhabdos,* rod, wand. rhab'dites; rhabdocœ'lous, straight gut; rhab'dome.

rhachis, Gr. ῥάχις, *rhachis,* backbone. rha'chis or ra'chis, axis, pl. rhach'ides.

rhag-, Gr. ῥάξ (ῥαγ-), *rhax (rhag-),* grape-cluster. rha'gon sponge.

rhag-, see rrhag-.

rhaph-, Gr. ῥαφίς (ῥαφιδ-), *rhăphis (rhaphid-),* needle, pin. rhaph'id; rhaph'ides or raph'ides, needle-like crystals.

rheo-, Gr. ῥέω, *rheo,* flow. res'in; rheotax'is; rheot'ropism, stream orientation.

rhin-, Gr. ῥίς, (ῥιν-), *rhis (rhīn-),* nose. cat'arhine; plat'yrhine; rhinoc'eros, nose horn.

rhiz-, Gr. ῥίζα, *rhiza,* root, origin. rhi'zoid, root like; rhi'-zome; Rhizop'oda, original legs (Ameba, etc.).

rhod-, Gr. ῥόδον, *rhodon,* rose. Rhodophy'ceæ, red algæ.

rhopal-, Gr. ῥόπαλον, *rhopalon,* club. Rhopaloc'era, clubbed antennæ (butterflies).

rhynch-, Gr. ῥύγχος, *rhynchos,* snout, beak. Ornithorhyn'-chus, bird beak; Rhynchocepha'lia, snout head; Rhyn-choph'ora, snout bearing (weevils).

Ribes, Ar. *ribes,* currant.

Riccia, <P. F. Ricci, Italian botanist.

rice, Fr. *riz* (<L. *oryza,* Gr. ὄρυζα, *oryza),* rice.

ripa-, L. *rīpa,* bank of stream. ripa'rian, ripic'olous.

robin, OF. *robin,* dim. of Robert.

rod-, L. *rōdo,* gnaw. Corroden'tia (book-lice); ero'sion; Roden'tia, gnawers (rats, etc.).

roe, AS. *roan,* fish spawn.

root, AS. *rōt,* root. root'stock.

Rosa, L. *rŏsa,* rose. prim'rose (L. *prima,* springtime); rosa'-ceous.

rostrum, L. *rostrum,* beak, prow. rostel'lum (dim.); ros'-trate.

rot-, L. *rŏta,* wheel. rota'tor or ro'tator; Rotato'ria; Rotif'-era, wheel bearing; rotund'.

-rrhag-, Gr. ῥήγνυμι, *rhēgnumi,* burst, break. hem'orrhage, blood burst. (Note: when transliterating ῥ, *rh,* when not initial, the r is sometimes doubled.)

Rubus, L. *rŭbus,* bramble (<L. *rŭber,* red, for red rasp-berry).

rud-, L. *rŭdīmentum,* first attempt, in rough state. erudi-tion, out of the rough; rude; ru'diment.

rug-, L. *rūga,* facial wrinkle. ru'gose (L. *rūgōsus,* full of wrinkles).

rum-, L. *rumen (rumin-),* gullet (<L. *rūmīno,* chew cud).

ru'minant.

rupi-, L. *rūpes (rūpis),* rock. rupic'olous, rock dweller.

rupt-, L. *rumpo (rupt-),* break, burst. abrupt'; disrupt'; erup'tion; rup'ture.

rye, AS. *ryge.*

S

sac-, Gr. *σάκκος, sakkos,* sack, bag, purse. em'bryo-sac; sac'-cate; sac'culus.

sacchar-, L. *saccăron,* Gr. *σάκχαρον, sakcharon,* sugar. Saccharomyce'tes, sugar fungi.

sacrum, L. *sacrum,* holy, offered in sacrifice. sa'cral.

sagitta, L. *sagitta,* arrow. sag'ittate, arrowhead shape; sag'-ittal suture, *i.e.* middle suture of human skull in front of arrowhead-shaped interparietal bone; sag'ittal plane, *i.e.* median plane begun by sagittal suture.

salamander, Gr. *σαλαμάνδρα, salamandra,* salamander.

salient-, salt-, L. *salio,* leap; *salto,* jump, dance. Salien'tia, leapers (frogs); sal'mon; sal'tant; salta'tion.

saliv-, L. *salīva,* spittle (akin to slime). sal'ivary; sal'ivate.

Salix, L. *sălix,* willow.

salping-, Gr. *σάλπιγξ, salpinx,* trumpet. sal'pinx, pl. salpin'-ges; Urosal'pinx.

samara, L. *samāra,* elm seed. sama'ra.

sang-, L. *sanguis,* blood. consanguin'eous, blood-relationship; cousin.

sap, AS. *sæp,* sap. sap-wood.

sapr-, Gr. *σαπρός, sapros,* rotten, decayed. sap'rophyte, *i.e.* plant living on decaying matter.

sarc-, Gr. *σάρξ, sarx,* flesh. ec'tosarc, outer protoplasm; per'-isarc; sar'code, flesh-like; Sarcodi'na, protoplasmic (Ameba, etc.).

saur-, Gr. *σαῦρος, sauros,* lizard. Di'nosaur; Ich'thyosaur, fish lizard; sau'rian; Saurop'sida, lizard appearance.

sax-, L. *saxum,* stone. sas'safras (Span. *sasafras* < L. *saxi-*

fraga); saxic'olous, rock inhabiting; sax'ifrage (L. *frango*, break).

scab-, L. *scăber*, rough; L. *scăbo*, scratch. scab; sca'beous.

scal-, L. *scālæ, scālaria*, ladder. scalar'iform, ladder shaped; scale (as graduated series).

scale, AS. *scāle*, bowl. plac'oid scale; scale-insect.

scallop, D. *schelp*, shell. scalp, shell fish; scaup-duck, scallop- or scalp-eater.

scape, L. *scăpus*, stem. sca'pose.

scaph-, Gr. σκάφη, *skaphē*, bowl, dug-out boat. scaph'oid, boat shaped; Scaphop'oda, boat footed. (See scaphism, p. 27.)

scapula, L. *scapulæ*, shoulder-blades. interscap'ular; scapula're.

schiz-, Gr. σχίζω, *schizō*, split, cleave. Schizomyce'tes, fission fungi; schiz'ont; Schizoph'yta, fission plants; schizop'oda, toed. (Note: ch pronounced like k.)

sci-, L. *scio*, know. con'science; sci'ence.

scion, Fr. *scion*, sprout.

sciss-, L. *scindo (sciss-)*, cut. abscis'sion, off cut.

scler-, Gr. σκληρός, *sklēros*, hard. scleren'chyma, hard juice; scle'rite; scle'roblast; sclerot'ic.

scolex, Gr. σκώληξ, *skōlēx*, worm. prosco'lex, before worm.

scolopendra Gr. σκολόπενδρα, *skolopendra*, centipede. Scolopen'dra.

scop-, Gr. σκοπέω, *skopeō*, look, observe closely. mi'croscope; scope; steth'oscope.

scopa, L. *scōpa*, brush, broom. sco'piform.

scorpion, L. *scorpĭo (scorpiōn-)*; Gr. σκορπίος, *skorpios*. pseudoscor'pion; scor'pioid; Scorpion'ida.

scrobe, L. *scrŏbis*, trench. scrobic'ulate.

scrotum, L. *scrōtum*, pouch. scro'tal.

scutum, L. *scutum*, shield. postscutel'lum; scutel'lum, tray; scu'tiform.

scyph-, Gr. σκύφος, *skyphos*, cup. scyphomedu'sa; Scyphozo'a, cup animals (jelly fish).

se-, L. *sē*, aside, apart. *se*cre'tion (*sē* + L. *cerno* [*cret-*], sift); *se*grega'tion (L. *grex* [*greg-*], herd); *se*p'arate (L. *paro*, prepare).

seal, AS. *seol.* sea-lion (*i.e.* seal lion).

seb-, L. *sēbum,* wax, grease. seba'ceous; se'bum.

secret-, L. *sēcrētus,* separated. secre'tion; secre'tory.

sect-, L. *sĕco (sectum),* cut. dis'sect, apart cut; Insec'ta, in cut (insects); sec'tion; sec'tor; secto'rial.

secular, L. *sæculāris,* worldly, temporal, belonging to age.

secund, L. *sĕcundus,* following. sec'ondary roots; se'cund.

sed-, L. *sĕdĕo,* sit. sed'entary (L. *sedentārius,* attached); sed'-iment, settling.

sedge, AS. *secg,* cutter (see Carex).

see, AS. *seōn.* sight (AS. *gesihth).*

seed, AS. *sæd,* seed (<AS. *sāwan,* sow).

segment, L. *segmentum,* piece cut off (L. *seco,* cut). seg-menta'tion.

selach-, Gr. σέλαχος, *selăchos,* shark. Sela'chii (sharks).

selagin-, L. *selăgo (selagin-),* juniper. Selaginel'la, small juniper.

select-, L. *sēlĭgo (sēlectus),* choose. (<L. *se,* apart + *lego,* pick). selec'tion; selec'tive.

selen-, Gr. σελήνη, *selēnē,* moon. sele'nodont, crescent tooth; selenot'ropism, moonlight reaction.

semen, L. *sēmen,* seed. insemina'tion, in seeding; sem'inal; seminary (see p. 38); seminif'erous.

semi, L. *semi-,* half, partly. semipal'mate, partly web-foot; semiper'meable.

senesc-, L. *sĕnex,* old man. senes'cence; se'nile (L. *sĕnīlis,* aged); se'nior (L. comp. of *senex*).

sense, L. *sentio (sensus),* feel. sense-organ; senso'rium; sen'-sory; sen'tient.

sep-, Gr. σήπω, *sēpō,* make rotten, putrify. antisep'sis, op-posed to rot; asep'sis, without decay; sep'tic.

sepal, <L. *separo,* separate, divide, or < Gr. σκέπη, *skepē,* covering. polysep'alous; sep'al or se'pal.

sepia, Gr. σηπία, *sēpia,* cuttlefish.

septum, L. *sæpes (sæptum),* fence, barrier. dissep'iment; myosep'ta, muscle partitions; sep'tate.

series, L. *sĕrĭes,* row (L. *sĕro* [*sert-*], join together). des'ert, unbound; disserta'tion, unjoined; exser'ted; in'sert; se'-rial.

serpent, L. *serpens,* creeper. Ser′pula, dim. (annelid worm).
serr-, L. *serra,* saw (L. *seco,* cut in pieces). ser′rate; ser′-rulate.
sert-, L. *sertum,* garland. Sertula′ria (hydrozoan).
serum, L. *sĕrum,* watery part. serol′ogy; sero′sa, serum full; ser′ous.
sessile, L. *sessĭlis,* not stalked, sedentary. ses′sile.
seta, L. *sēta,* bristle, coarse hair. Equise′tum, horse hair; seta′ceous; se′tæ (pl.); setig′erous, bristle producing; se′tose.
sex, L. *sexus,* sex. asex′ual; bisex′ual; sex-linkage.
shank, ME. *shanke* (<AS. *scanca;* Germ. *schenkel*), femur.
shark, <Gr. καρχαρίας, *karcharias,* shark; or D. *schrok,* glutton; or Norw. *harka,* scrape.
sheep, AS. *scēap.*
shin, AS. *scina* (Germ. *schiene*), shinbone.
shoulder, AS. *sculder.*
shrew, AS. *screāwa,* shrew, *i.e.* biter.
shrimp, ME. *shrimp* (<AS. *scrimman,* shrink). (Cf. cramp, crimp, scraggy, scrimp, shrink, shrub, shrug.)
sib, AS. *sib,* kin. sib′ling.
sil-, L. *sĭlex (silicis),* flint. silic′ious.
siliq-, L. *silĭqua,* pod. sil′icle (dim.); sil′iqua; silique (Fr.).
silur-, <L. *Silŭres,* pre-Celtic inhabitants of Wales. Silu′-rian.
sim-, L. *simia,* ape (<Gr. σιμός, *simos,* flat-nosed). Sim′ian; sim′ious.
simil-, L. *sĭmĭlis,* like. assimila′tion (<L. *ad* + *similis*); sim′ulate.
simplex, L. *simplex,* once, simple (<L. *semel,* once + *plex,* fold). sim′ple.
sin-, L. *Sinæ,* Gr. Σίναι, *Sinai,* ancient Chinese. Sinanthro′-pus.
sinister, L. *sinister,* left hand, unlucky. sin′istrai.
sinus, L. *sīnus,* basin. fron′tal si′nus; *si′nus veno′sus.*
sinus, L. *sĭnus,* bend. insin′uate; sin′uate; sin′uous.
siphon, L. *sipho,* Gr. σίφων, *siphōn,* tube, sucker. si′phuncle (dim.); siphon′oglyph, sucking groove; Siphuncula′ta (lice).

sipunc-, L. *sipunculus* or *siphunculus,* small pipe. Sipuncu'lida (worms).

siren, Gr. σειρήν, *seirēn,* mermaid, siren. Sire'nia (manatee).

sit-, Gr. σῖτος, *sītos,* food. par'asītism; par'asītoid; parasītol'ogy.

skate, Icel. *skata,* skate.

skeleton, Gr. σκελετόν, *skeleton,* dried body (<Gr. σκέλλω, *skellō,* dry up). endoskel'eton; exoskel'eton.

skin, AS. *scinn,* skin.

skink, L. *scincus,* Gr. σκίνκος, *skinkos,* lizard.

skull, Icel. *skāl,* skull, bowl.

skunk, Am. Ind. *seganku.*

slug, ME. *slugge,* sluggard.

smell, ME. *smellen* (akin to smolder).

smut, AS. *smitta,* spot. smut spores; wheat smut.

snail, AS. *snægl,* snail (=little creeper).

snake, AS. *snaca,* snake (<AS. *snīcan,* creep). (Like sneak, snail.)

snipe, Icel. *snipe* (cognate with snip).

soci-, L. *sŏcĭo,* join, unite. associa'tion; consocia'tion; conso'cies; disso'ciate; so'cial; soci'ety (L. *sŏcĭĕtas,* company < *sŏcĭus,* taking part, sharing in).

socket, dim. of L. *soccus,* shoe, sock.

sol, L. *sōl (sōlis),* sun. so'lar; Solpu'gida (NL. *solpuga,* <L. *sōlĭfŭga,* sun fleeing).

sol-, L. *sŏlum,* bottom of foot, foundation. sole.

sol-, L. *sōlus* alone, single. sol'itary.

sol-, L. *solvo (solūtus),* solve, melt, free (<*se,* apart, + *luo* set free). dissolve'; sol; sol'uble; sol'ute; solu'tion; sol'vent. (Cf. *gel-.*)

sole, Gr. σωλήν, *sōlēn,* pipe, gutter. Solen'idæ (razorclams); typh'losole, blind channel.

solid, L. *solido,* unite, make whole. sol'id (L. *solidus,* hard, compact, dense); Solida'go, vulnerary (goldenrod); solid'ify.

som-, Gr. σῶμα (σωματ-), *sōma (sōmat-),* body, any material body. chro'mosome; polyso'mic; proso'ma; somat'ic, bodily; so'mite, section of body; triso'mic; tryp'anosome,

boring body.

sorb-, L. *sorbĕo (sorptum),* drink up. absorp'tion; adsorp'-tion.

sorrel, OF. *surele,* sorrel (<Teut. *sūr;* Germ. *sauer,* sour). sor'rel, the plant.

sorrel, Germ. *sor,* withered. sor'rel, adj. of color.

sorus, Gr. σωρός, *sōros,* a heap (of grain). so'ri (pl.).

sow, ME. *sowe,* L. *sūs* (<Gr. ὗς, *hus,* imitative).

spadix, Gr. σπάδιξ (σπαδικ-), *spadix (spadik-),* a branch torn off. spa'dix, pl. spadi'ces.

sparrow, AS. *spearwa,* sparrow (from root of spur).

spathe, Gr. σπάθη, *spathē,* broadsword, stem of palm-leaf. spade; spat'ula (dim.).

spawn, <L. *expando* (L. *ex,* out + *pando,* spread). spawn-ing.

spec-, L. *spĕcĭo,* see, look. as'pect; specializa'tion; spe'cies (L. *spĕcĭes,* appearance, kind, sort); spec'imen, sample; spec'trum.

spele-, L. *spelæum,* Gr. σπήλαιον, *spēlaion,* cave. spelæ'an; spe'leology.

sperm, Gr. σπέρμα (σπερματ-), *sperma (spermat-),* seed, germ, semen. en'dosperm, inside germ; gym'nosperm, naked seed; spermathe'ca, sperm case; sperm'atophore, sperm bearer; Spermatoph'yta, seed plants; spermatazo'on, germ animal; sperm'ist.

sphagnum, Gr. σφάγνος, *sphagnos,* moss.

sphen, Gr. σφήν, *sphēn,* wedge. sphe'noid, wedge like; Sphe'-nodon, wedge tooth.

spher-, Gr. σφαῖρα, *sphaira,* ball. at'mosphere, vapor round; cen'trosphere, central ball.

sphinct-, Gr. σφίγγω, *sphingō,* bind tight. sphinc'ter; sphinx caterpillar.

sphygm-, Gr. σφυγμός, *sphygmos,* pulse, heart-beat. asphyx'-ia, without pulse; sphyg'mogram, pulse record.

spic-, L. *spīca, spīcum,* spike, head of grain. spi'cate; spic'ule (dim.); spike.

spider, spin, ME. *spither, spinnere,* spider (<AS. *spinnan,* spin). spind'le; spin'neret.

spike, L. *spīca,* head of grain; point.

spina, L. *spīna,* thorn, back-bone. spi′nal; spineless; spi′-nous; spin′ule.

spir-, L. *spīra,* Gr. σπεῖρα, *speira,* coil. spi′ral; spi′reme; Spiril′lum; Spirogy′ra.

spir-, L. *spīro,* breathe. perspire′; respira′tion, back breathing; spi′racle or spir′acle (L. *spīraculum,* breathing hole); transpira′tion.

splanch-, Gr. σπλάγχνον, *splanchnon,* viscera, inwards. splanch′nic; splanch′nopleure, inwards side.

spleen, splen-, L. *splēn,* Gr. σπλήν, *splēn,* spleen. spleen′wort; sple′nic or splen′ic; sple′noid, spleen like.

spondyl-, Gr. σπόνδυλος, *spondylos,* vertebra. spon′dyl; spon′-dylous, vertebral.

spong-, Gr. σπόγγος, *spongos,* sponge. Desmospon′giæ, ligamentous sponges; spon′gin; spon′gioplasm, spongy formation.

spor-, Gr. σπορά, *spora,* spore, seed. (Cf. sperm.) conid′io-spore, dust spore; sporan′gium, spore case; spor′ocyst, spore sac; sporogo′nium, spore organ; spor′ont; spor′-ophyte, spore plant; Sporozo′a, spore animals; teleu′-tospore, final spore.

spruce, <OF. *Pruce,* Prussian (fir).

spur, AS. *spora,* goad.

squam-, L. *squāma,* scale. desquama′tion; squa′mous; Squama′ta (lizards and snakes).

squarros-, L. *squarrōsus,* scurfy. squar′rose; squar′rulose.

squash, <Am. Ind. *asquash,* raw vegetables. squash-bug; summer squash.

squid, <Early Engl. *squit (<squirt).*

squirrel, OF. *esquirel* (<L. *sciurus;* Gr. σκίουρος, *skiouros* <σκιά, *skia,* shadow, + οὐρά, *oura,* tail).

st-, stat-, L. *sto (stătum),* stand, set. intersti′tial; obstet′rics; stabil′ity; state, a position; statis′tics (sing.); sta′tion; sta′tus.

stal-, stol-, Gr. στέλλω, *stellō,* arrange, send; στάλσις, *stalsis,* constriction. dias′tolē, sent apart; peristal′sis; sys′tolē, together drawn.

stamen, L. *stāmen,* an erect thread. staminif′erous; stam′-inate. (See p. 8.)

stapes, LL. *stapes,* stirrup. (Romans did not ride with stirrups.)

staphyl-, Gr. σταφυλή, *staphylē,* bunch of grapes. Staphylococ′cus.

starling, dim. of AS. *stær,* starling (<L. *sturnus,* starling).

stas-, Gr. στάσις, *stasis,* standing, placing, weighing (<Gr. ἵστημι, *histēmi,* place, put). di′astase, putting apart; epis′tasy, standing above; hypostat′ic, standing below; sys′tem (Gr. σύστημα, *systēma,* composition); systemat′ic.

stato-, Gr. στατός, *statos,* standing. stat′ic; stat′oblast, standing bud; stat′ocyst; stat′olith.

steg-, Gr. στέγος, *stegos,* cover, roof. Stegocepha′lia, roof head; Steg′osaur, plated reptile.

stele, L. *stēla,* Gr. στήλη, *stēlē,* post, column, pillar; AS. *stæl,* stalk (cf. style). siphonoste′le; ste′lē, pl. ste′lai or ste′lēs.

stell-, L. *stella,* star. stel′late.

stem, AS. *stemn,* stem (<AS. *stæf,* staff).

steno-, Gr. στενός, *stenos,* narrow. stenoceph′alous, narrow headed; stenopet′alous; stenophyl′lous, narrow leaved; stenozo′nal, of narrow range.

stentor, Gr. Στέντωρ, *Stentōr,* Stentor the loud voiced. Sten′tor (trumpet animalcule).

stere-, Gr. στερεός, *stereos,* stiff, solid. ster′eome or ste′reome (Gr. στερέωμα, *stereōma,* foundation); stereoscop′ic, solid view; stereotax′is, solid contact with.

sterigma, Gr. στήριγμα, *stērigma,* support. stērig′mata (pl.).

steril-, L. *stĕrĭlis,* barren. steril′ity; steriliza′tion.

stern-, Gr. στέρνον, *sternon,* breast. proster′num, forward breast; ster′nal.

steth-, Gr. στῆθος, *stēthos,* breast. steth′oscope.

stich-, Gr. στίχος, *stichos,* row (<Gr. στείχω, *steichō,* go in line). dis′tichous, double rowed.

stigma, Gr. στίγμα, *stigma,* puncture, brand-mark. stig′mata (pl.).

stimulus, L. *stimulus,* goad, prick, incentive. stim′ulate; stim′uli (pl.).

stinct-, L. *stinguo,* prick, goad. (Cf. *stigma,* stick.) distin′guish; extinct; in′stinct; sting.

stip-, L. *stīpes (stipĭt-),* stalk. stīpe; sti′pes, pl. stip′ites; stip′-

ule (dim.); stub'ble.

stirp-, L. *stirps,* root, stem. ex'tirpate, out root.

stolon, L. *stŏlo (stolōn-),* superfluous shoot on a tree. sto'-lon; stolonif'erous.

stom-, Gr. *στόμα (στοματ-), stoma (stomat-),* mouth. anastomo'-sis; stom'ata, mouths; stomode'um, mouth opening.

stomach, L. *stŏmăchus,* Gr. *στόμαχος, stomachos,* gullet.

stork, AS. *storc.*

stratum, L. *strātum,* that which is spread out (L. *sterno,* spread). pros'trate; strat'ified, layer made; substra'tum.

strawberry, AS. *strēawberige* (<AS. *streowian,* strew, *i.e.* spreading by runners; see p. 24).

strept-, Gr. *στρεπτός, streptos,* easily bent, pliant; necklace. Streptococ'cus, necklace coccus.

stria, L. *strĭa,* furrow. stri'ate.

strict-, L. *stringo (strictum),* hold fast, contract. astrin'gent; constric'tion; straight; strain; strict.

strid-, L. *strīdulus,* creaking. stri'dent; stridula'tion.

strig-, L. *strĭga,* furrow; *strĭgĭlis,* scraper. strig'ilate, with scraper; stri'gose, with furrow.

strob-, Gr. *στροβέω, strobeō,* whirl around like a top (<Gr. *στρέφω, strephō,* twist). strob'ilate; strobi'lus (Gr. *στρόβιλος, strobīlos,* pine-cone); strob'oscope.

stroma, Gr. *στρῶμα, strōma,* bed. stromat'ic, embedded.

strongyl-, Gr. *στρογγύλος, strongylos,* well rounded (<Gr. *στρογγύλλω, strongyllō,* twirl). Strongylocen'trotus (Gr. *κεντρόω, kentroō,* furnish with spikes), see p. 3.

strophe, Gr. *στροφή, strophē,* turning around. catas'trophe.

struct-, L. *struo (struct-),* pile up, build. construc'tion; de-struc'tive; obstruc'ture; superstruc'ture.

stup-, L. *stupeo,* void of sensibility. stu'pefy; stu'pid; stu'por.

sturgeon, ME. *sturgium,* wallower in mud (<AS. *styria,* stirrer; LL. *sturio,* sturgeon).

style, Gr. *στῦλος, stylos,* pillar, post, beam. (Cf. stele.) en'-dostyle, internal beam; sty'let (dim.); Stylony'chia, stalk claws.

styp-, Gr. *στύφω, styphō,* draw together. styp'tic.

sub, L. *sub,* under, after, not quite, somewhat. Modified when used as a prefix, *e.g.*:

sub-, *sub*cos'ta; *sub*spe'cies; *sub*terra'nean; *sub*umbrel'la.
suc-, *suc*cinct'; *suc*ces'sion.
suf-, *suf*'fix; *suf*'focate.
sup-, *sup*port'; *sup*ply'; *sup*press'.
sus-, *sus*cep'tible; *sus*pen'sor.

suber, L. *sūber,* cork. su'berin.

subul-, L. *subula,* awl. sub'ulate; sub'uliform, awl shaped.

succus, L. *succus, sūcus,* sap, juice. *suc'cus enter'icus,* intestinal juice.

suct-, L. *sugo (suctum),* suck. suc'culent; suc'tion; Sucto'ria (fleas).

sud-, L. *sudo (sudatum),* emit moisture. exuda'tion; sudorif'ic, sweat producing; sweat; transuda'tion.

sulcus, L. *sulcus,* furrow. sul'cate.

super-, L.*super (supra-, sur-),* above, over (=Gr. ὑπέρ, *hyper*). *super*fic'ial, exterior figure; *supe'r*ior (comp.); *supra*œsopha'geal, above gullet; *supra*re'nal, over kidney; *sur*-face, top side.

supin-, L. *supīnus,* bent back, lying on the back. resu'pinate.

sus, L. *sūs* (<Gr. ὗς, *hus*), sow. (Mem. cesspool < ME. *suspool.*)

sut-, L. *sūo (sūtum),* sew together. su'tural; su'ture.

swallow, (1) AS. *swalewe,* swift bird. (2) AS. *swelgan,* glutition.

swan, AS. *swan.*

sweat, AS. *swāt,* sweat (<L. *sudatum).* sweat-gland.

swim, AS. *swimman,* swim. swim-bladder; swim'meret.

sycon, Gr. σῦκον, *sykon,* fig. syc'amore (Gr. μόρον, *moron,* mulberry); syco'nium; sy'con sponge.

syn-, Gr. σύν, *syn,* together, with (=L. *cum*). Modified when used as prefix, *e.g.*:
sy-, *sy*stem (Gr. σύν + ἵστημι, *histēmi,* stand); *sy*stōlē (Gr. σύν + στέλλω, *stellō,* send).
sym-, *sym*bio'sis, together living; *sym*pathet'ic; *sym*'physis, together grown; *sym*'metry.
syn-, *syn*cyt'ium, together cell; *syn*er'gid, co-worker.

syring-, Gr. σῦριγξ (συριγγ-), *syrinx (syring-),* shepherd's pipe. Syrin'ga, *i.e.* used for pipestems (lilac, etc.); syr'inx, pl.

syrin'ges (see p. 7).

system, Gr. σύστημα, *systēma,* put together, a composite whole. systemat'ic; syste'mic or system'ic.

T

tachy-, Gr. ταχύς, *tachys,* quick. tach'ina-fly; tachygen'esis, rapid development.

tactil-, L. *tactĭlis,* tangible; L. *tactus,* touch. con'tact; tac'-tile; tac'tual, pertaining to touch sense.

tadpole, ME. *tade,* toad, + *poll,* head. (Cf. pollywog, toad-stool.)

tæn-, Gr. ταινία, *tainia,* ribbon, band. Tæ'nia (tapeworm).

tanager, S. Am. Ind. *tangara* (>NL. *tanagra*).

tansy, OF. *tanesie,* tansy (<Gr. ἀθανασία, *athanasia,* immortality).

tap-, Gr. ταπής, *tapēs,* carpet. tape'tum.

tapir, S. Am. Ind. *tapyra.*

tarant-, It. *Taranto,* L. *Tarentum,* district in Italy. taran'-tula, spider of Tarentum whose bite was fabled to cause a dancing mania, called tarantism. (See p. 30.)

tard-, L. *tardus,* slow. retarda'tion; Tardig'rada, slow walker (sloths); tar'digrade.

tarsus, Gr. ταρσός, *tarsos,* broad flat surface. metatar'sal; Tar'-sius, tarsier.

taste, OF. *taster* (<L. *taxo* < *tango,* touch).

taxis, Gr. τάξις, *taxis,* arrangement. chemotac'tic, chemical arrangement; phyllotax'y, leaf arrangement; tax'idermy, arranged skin; taxon'omy, arrangement law.

teat, AS. *tit,* teat.

tect-, L. *tego (tect-),* cover, shield. obtec'ted; protec'tion; tecto'rium.

teg-, L. *tegmen, tegimen,* a cover. integ'ument; teg'ula.

tel-, Gr. τέλος, *telos,* accomplishment, end, goal. te'liospore, end spore; tel'ium or te'lium, pl. te'lia; tel'ophase, completion stage.

tel-, Gr. τῆλε, *tēle,* far off. tēleg′ony, distant mating; tēlenceph′alon, end brain; tēlolec′ithal, end yolk.

tele-, Gr. τέλεος *teleos,* or τέλειος, *teleios,* whole, perfect. tĕleol′ogy or tēleol′ogy; tel′eost or te′leost, perfect bone.

teleut-, Gr. τελευτή, *teleutē,* fulfillment. teleu′tospore, concluding spore.

telson, Gr. τέλσον, *telson,* boundary, limit. tel′son.

temp-, L. *tempus* (pl. *tempora*), a designated place or time; temple. contem′porary; tem′poral bone.

tend-, L. *tendo (tentum* and *tensum),* stretch. ten′don; ten′dril (?<L. *tĕner,* thin); tento′rium (L. *tentōrium,* tent).

tene-, Gr. τείνω, *teinō,* stretch out. dip′lotene; lep′totene, thin stretch; neot′eny, youth prolonged.

tent-, L. *tento,* touch, feel. ten′tacle, feeler; tentac′ulocyst, tentacle cavity.

tenu-, L. *tĕnŭis,* thin, weak. atten′uate; ten′uous.

ter-, trit-, L. *tĕro (trīt-)* (<Gr. τείρω, *teirō),* rub, wear away. Terebran′tia, boring; Terebrat′ula, bored (L. *terebra,* gimlet); Tere′do (Gr. τερηδών, *terēdōn,* boring worm); ter′ete (L. *tēres,* well turned); Ter′mes (L., wood gnawer).

terat-, Gr. τέρας (τερατ-), *teras (terat-),* portent, monster. teratol′ogy.

tergum, L. *tergum,* back. ter′gite.

termin-, L. *termĭno,* limit, set bounds to. deter′miner; indeter′minate; ter′minal; terminol′ogy, study of terms.

tern, Dan. *terne.*

tern-, L. *terni,* by threes. ter′nary, ter′nate.

terr-, L. *terra,* earth. subterra′nean; terres′trial; terric′olous, earth dwelling; ter′rier, a digging dog.

tĕrrapin, Am. Ind. *turupe,* turtle.

tertiary, L. *tertiārius,* third. ter′tial; Ter′tiary, third formation.

tessel-, L. *tessellæ,* dice cubes (<Gr. τέσσαρα *tessara,* four). tes′selated, set with small squares.

test, L. *testa,* shell. test; testa′ceous (see p. 39); Testudina′ta (turtles).

testis, L. *testis,* witness. tes′tes, pl. (see p. 26); tes′ticle (dim.).

tetra, contraction from Gr. τέσσαρες, *tessares,* four. tet′rad

(Gr. τετράδιον, *tetradion,* four things); tetrakaidecahe'-dron, four and ten sides; tet'rapod, four-footed; tet'-raspore, quadruple spore.

thalamus, Gr. θάλαμος, *thalămos,* chamber. thalamenceph'-alon, vesicle brain; thala'mium.

thalass-, Gr. θάλασσα, *thalassa,* θάλαττα, *thalatta,* sea. thalas'-sic; Thalattosu'chia, sea crocodile.

thallus, Gr. θαλλός, *thallos,* a young shoot. prothal'lus, for thallus; Thalloph'yta, thallus plants.

thec-, Gr. θήκη, *thēkē,* case, box, repository. apoth'ecary, out of boxes; apothe'cia; Glœothe'ce, glue case; oothe'ca, egg case.

thel-, Gr. θηλή, *thēlē,* nipple. epithe'lium, on nipple.

ther-, Gr. θήρ, *thēr,* beast. Euthe'ria, true beasts; Theromor'-pha, beast shaped.

therm-, Gr. θέρμη, *thermē,* heat. thermodynam'ics; thermom'-eter, heat measure; thermophil'ic, heat preferring; ther-motax'is, movement to heat; thermot'ropism, heat turn-ing.

thes-, thet-, Gr. θέσις, *thesis,* setting, arranging. hypoth'esis, supposition; syn'thesis, together putting.

thigh, AS. *theōh,* thigh.

thigmo-, Gr. θίγμα, *thigma,* touch. thigmotax'is, touch ori-entation; thigmot'ropism, touch turning.

thirst, AS. *thyrst.*

thistle, AS. *thistel.*

thorac-, L. *thōrax,* Gr. θώραξ, *thōrax,* chest. protho'rax, front thorax; thōrac'ic.

thrips, Gr. θρίψ, *thrips,* a small insect.

throat, AS. *throte,* throat.

thromb-, Gr. θρόμβος, *thrombos,* lump, clot, curd. throm'bin, clotting substance; throm'bocyte, clotting cell; thrombo'-sis.

thrush, AS. *thrysce.*

thym-, Gr. θύμον, *thymon,* thyme, incense (<Gr. θύω, *thyō,* sacrifice). thyme, the aromatic plant used as incense dur-ing sacrifices.

thym-, Gr. θύμος, *thymos,* soul, emotion. thy'mus gland.

thyr-, Gr. θυρέος, *thyreos,* shield. thy'roid, shield shaped.

thysan-, Gr. θύσανος, *thysanos,* fringe, tassel. Thysanop′tera, fringe wings (thrips); Thysanu′ra, fringe tail.

tibia, L. *tībia,* shin bone. tib′ial; tibia′le. (See Tibicen, p. 27.)

tick, ME. *teke.*

tiger, Gr. τίγρις, *tigris* (<O. Pers. *tighri,* arrow). ti′ger (*i.e.* swift); ti′gress.

Tilia, L. *tĭlĭa,* linden tree.

tissue, F. *tissu,* fabric (<L. *texo,* weave).

tit-, Icel. *tittr,* small bird. tit′lark; tit′mouse (AS. *māse,* bird); tom′tit.

toad, AS. *tādie,* toad. tad′pole, toad poll, *i.e.* head; toad′stool (Germ. *todes,* death, + AS. *stōl,* sprout).

tobacco, Span., W. Ind. *tabaco,* pipe.

toe, AS. *tā,* toe.

tok-, Gr. τόκος, *tokos,* offspring. at′okous, without offspring; epit′oke, fruitful part.

tom-, Gr. τομή, *tomē,* cutting. anat′omy, off cut; dichot′omy, cut in two; entomol′ogy, insect study; zoot′omy, animal cutting.

tomato, Mex. *tomatl.*

tomentum, L. *tomentum,* stuffing of a cushion. tomen′tose or to′mentose.

ton-, Gr. τόνος, *tonos,* rope, stretching, tune (<Gr. τείνω, *teinō.* stretch). auxoton′ic, growth stimulant; ec′otone, tension-zone; isoton′ic, same tune; peritone′um, around stretched; ton′oplast, stretched plasm; tonotax′is, osmotic pressure movement.

tongue, AS. *tunge,* tongue.

tonsils, L. *tonsillæ,* tonsils.

tooth, AS. *tōth.*

top-, Gr. τόπος, *topos,* place. bi′otope, life locality; eurytop′ic, of wide range; stenotop′ic, of narrow range; topog′raphy, place charting; top′otype, locality type.

tor-, L. *tŏrus,* rounded projection; knot in a rope; marriage bed. to′rose, knobbed; to′rus.

torn-, L. *torno,* Gr. τορνεύω, *torneuō,* turn around. torna′ria larvæ; tor′sion, twisting; tor′tuous.

tot-, L. *tōtus,* whole, all. to′tal; totip′otent.

tox-, Gr. τοξικόν, *toxikon,* arrow-poison (<Gr. τόξον, *toxon,* bow). antitox′in, against poison; tox′ic (see p. 9); toxicol′ogy.

trab-, L. *trabs,* beam. trab′ant, pertaining to the *trabs cerebri* or *cor′pus callo′sum;* trabec′ula, small bar.

trachea, Gr. τραχεία, *tracheia,* windpipe (<Gr. τραχύς, *trachys,* rough). tra′cheate.

tract-, L. *trăho (tractum),* drag, draw, lead. attrac′tion; contrac′tile; protrac′tor; retrac′tor, back draw.

trag-, Gr. τράγος, *tragos,* goat. antit′ragus; trag′acanth (goat horn); trag′icus; tra′gus (see p. 13).

trama, L. *trama,* woof. tra′ma, a web of hyphæ; tram′eloid.

trans, L. *trans,* across, change. *trans*forma′tion; *trans*gres′sive, stepping across; *trans*loca′tion, across place; *trans*pira′tion, across breathing.

trauma, Gr. τραῦμα, *trauma,* wound. traumat′ic, pertaining to wound or shock.

tree, AS. *treō,* tree. tree-fern; tree-frog.

tremat-, Gr. τρῆμα (τρηματ-) *trēma trēmat-),* hole. Monotre′ma, one (cloacal) opening; per′itreme, surrounding spiracle; Trēmato′da, having holes, *i.e.* suckers.

tri, L. *trēs,* Gr. τρεῖς, *treis,* neut. τρία, *tria,* three. Tricer′atops, three horned face; trihy′brid; triploblas′tic, three germ-layers; trip′loid (Gr. τριπλοῦς, *triplous,* triple); Tritubercula′ta.

Trias, L. *trias,* triad. Trias′sic, having three formations.

trich-, Gr. θρίξ (τριχ-), *thrix (trich-),* hair. Polyt′richum, many hairs (moss); Trichinel′la, little hairworm; trich′ocyst, hair bag; trich′ome, growth of hair; trichoph′yton, hair plant; U′lothrix, fleecy hair.

trich-, Gr. τρίχα, *tricha,* three-fold. trichot′omy.

Triton, Gr. Τρίτων, *Tritōn,* sea god, son of Neptune.

troch-, Gr. τροχός, *trochos,* wheel, Gr. τροχιλία, *trochilia,* pulley. Trochelmin′thes, wheel worms (rotifers); troch′lear; troch′ophore, wheel bearer.

trochant-, Gr. τροχαντήρ, *trochantēr,* ball of hip bone (<Gr. τρέχω, *trechō,* run). trochan′ter; trochan′tin.

trogl-, Gr. τρώγλη, *trōglē,* hole. troglo′bic, cave living; tro′glodyte, cave creep into.

troph-, Gr. τροφή, *trophē,* food. at'rophy, not nourished; hyper'trophy, over nourished; troph'ic, nursing; tro'phi, feeders; troph'oblast; troph'osome; trophozo'oid, nutritive polyp.

trop-, Gr. τροπή, *tropē,* turn around. orthot'ropous, straight growth; photot'ropism, to light turning; trop'ical, turning (of the sun); tro'pism, a turning.

-trorse, L. *introrsus*· for *introversus,* turned inward. an'trorse; ex'trorse (L. *extra,* outward, + *versus,* turned); in'trorse; re'trorse (L. *retro,* backward + *versus).*

trud-, L. *trūdo (trūsum),* thrust, push. extrude'; protru'sion.

trunc-, L. *trunco (trucat-),* lop off. trunca'tion.

trypan-, Gr. τρύπανον, *trypanon,* gimlet, borer. Trypanoso'ma, tryp'anosome, gimlet body.

tube, L. *tubus,* pipe, tube. tube-cell; tu'bular; tu'bule.

tuber, L. *tūber,* swelling. Multitubercula'ta, many cusps; protu'berant; tu'bercle.

tulip, Fr. *tulipe* (<Turk. *tulbend,* turban). tulip-tree.

tum-, L. *tūmeo (tumid-),* puff up. intumes'cence; tu'mid; tu'mor.

tunic-, L. *tūnĭca,* garment, covering. Tunica'ta, clothed in a tunic.

turb-, L. *turbo,* disturb, eddy. disturb'; Turbella'ria, small eddy; tur'bid; turb'inate, whirling.

turg-, L. *turgĕo, (turgidus),* swell up. tur'gor.

turkey, <Turkey, supposed provenience.

turnip, ME. *turn,* round, + *næp* (L. *napus*), turnip.

turtle, Span. *tortuga,* Port. *tartaruga,* tortoise. tortoise; turtle (see p. 21).

tycho-, Gr. τύχη, *tychē,* by chance. ty'chocœn, chance association.

tyl-, Gr. τύλη, *tylē,* lump, swelling. tylo'sis, lumpy.

tympan-, Gr. τύμπανον, *tympanon,* drum. tympan'ic; tym'panum.

typ-, Gr. τύπος, *typos,* a blow, model, type. hol'otype, complete type; phe'notype, evident pattern.

typhl-, τυφλός, *typhlos,* blind. typh'losole, blind channel.

U

udder, AS. *ūder,* udder.

-ule, diminutive suffix, Latin, occurring variously as -ula, -ulus, -ulum, -ular. artic′*ulus;* cel′l*ular;* fur′*cula;* hibernac′*ulum;* mol′*ecule;* nod′*ule;* Ranun′*culus.*

uln-, L. *ulna,* elbow. ul′nar; ulna′rē; ulnora′dial.

ulo-, Gr. οὖλος, *oulos,* woolly. Ulot′richi; U′lothrix, woolly hair.

ultra-, L. *ultra,* beyond. *ultra*filtra′tion; *ultra*mi′croscope; *ultra*vi′olet.

umbel-, L. *umbella,* parasol (dim. of *umbra,* shade). subumbrel′la (It. *ombrella*); um′bellate; Umbellif′era.

umbilic-, L. *umbilīcus,* navel. (Cf. *umbo.*) umbil′ical; umbili′cus.

umbo, L. *umbo (umbōn-),* raised center of shield. um′bo, pl. umbo′nes; um′bonal.

uncus, L. *uncus* (<Gr. ὄγκος, *onkos*), hook. un′cinal; un′cinate process.

und-, L. *unda,* wave. un′dulant; un′dulating, wavy.

ungu-, L. *unguis* (<Gr. ὄνυξ, *onyx*), toe-nail; L. *ungula* hoof, claw. triun′gulin, three-clawed; Unguicula′ta (clawed mammals); Ungula′ta (hoofed mammals); un′guligrade, hoof walker.

uni, L. *ūnus,* one. unilat′eral, one-sided; U′nio, clam with single pearl (L. *ūnio;* see onion, p. 120); u′nion; u′nit; u′nivalve; u′niverse, turned into one.

ur-, Gr. οὐρά, *oura,* tail. Urochor′da, tail notochord (tunicates); Urode′la, tail visible (salamanders); u′ropod, tail leg.

ur-, L. *ūrīna (*<Gr. οὖρον, *ouron),* urine. ure′ter (Gr. οὐρητήρ, *ourētēr);* ure′thra (Gr. οὐρήθρα, *ourēthra);* urinif′erous; urinogen′ital.

urchin, L. *erinacius,* hedgehog. sea-urchin.

uredo, L. *ūrēdo,* blight (<L. *ūro,* burn). uredi′nia; ure′

dospore, blight spore.

urtic-, L. *urtica,* nettle (<L. *ūro,* burn). ur'tical, stinging; ur'ticant.

ustilag-, NL. *ustilāgo,* smut fungus (<L. *ūro* [*ustus*], burn). (Cf. *uredo* and *urtica.*) ustilag'inous, smutty; Ustila'go (corn-smut).

uterus, L. *ŭtĕrus,* womb, paunch. u'teri (pl.); u'terine; utric'ulus (dim.).

uvula, L. *ūvula,* a small hanging bunch, *e.g.* grapes.

V

vacc-, L. *vacca,* cow. vaccina'tion; vac'cine; Vaccin'ium, cowberry (blueberry).

vacu-, L. *văcŭum,* empty space. va'cant; vacu'ity; vac'uole (dim.).

vagina, L. *vāgīna,* sheath, scabbard. evagina'tion; invag'-inate, in case.

vagus, L. *văgus,* wandering. vague; va'gus nerve.

val-, L. *văleo,* be well, strong. biv'alent or biva'lent, doubly strong; convales'cent; va'lency; val'id (L. *vălĭdus,* powerful); val'ue.

valv-, L. *valva,* folding door. (Cf. *volv-.*) aor'tic valve; bi'-valve; u'nivalve; val'vular; val'vate.

vari-, L. *vărĭus,* changeable. varia'tion; va'riegated; vari'ety.

varic-, L. *vāricus,* straddling (<L. *varus,* bandy leg). divar'-icate.

vas, L. *vās,* duct, vessel, vase. extrav'asated, out of vessel; *va'sa vaso'rum; vas def'erens;* vas'cular; vas'culum; vessel.

veget-, L. *vĕgĕtus,* lively, vigorous. veg'etative.

vel-, L. *vēlo,* cover, veil; L. *vēlum,* curtain. devel'opment; en'velope; ve'lar; vela'rium; ve'liger.

vena, L. *vēna,* vein, blood vessel. veined; veinlet; vena'tion; ve'nous.

vent-, L. *venter,* belly. ven'tral; ven'tricle, little belly.

vermis, L. *vermis,* worm. Ver'mes (pl.); ver'miform, worm shape; vermilion (see p. 37); ver'min.

vern-, L. *vēr,* springtime; L. *vernus,* relating to spring. ver'nal; verna'tion.

vers-, vert-, vort-, L. *verto (versum),* turn around. divertic'ulum; ever'sion, turned out; rever'sion, back turning; u'niverse, combined into one; Vorticel'la (dim. of L. *vortex,* that which turns).

vertebra, L. *vertebra,* a joint of the back. ver'tebral; Vertebra'ta, backboned.

vertic-, L. *vertex (vertic-),* whirl, crown of head. postver'tical, in back of the top of the head; ver'tex; vertic'ilate (L. *verticillus*), whorled.

vesic-, L. *vesīca,* bladder. vesica'tion, blister formation; ves'icle, little bladder; *vesic'ula semina'lis.*

vessel, L. *vascellum,* little vase. (Cf. *vas.*)

vest-, L. *vestio (vestitus),* clothe. invest'ment (L. *vestis,* garment); ves'titure.

vestibule, L. *vestibulum,* entrance-court (<L. *stabulum,* stable, < *sto,* stand). ves'tibule.

vestig-, L. *vestīgo,* follow the track of. inves'tigate; vestig'ial; vestig'ium, footstep.

vi-, L. *vĭa,* way. biv'ium; triv'ium, meeting of three roads.

vibr-, L. *vibro,* vibrate, quiver, curl. vibrac'ulum; Vib'rio; vibris'sæ, nostril-hairs.

vicia, L. *vicia,* vetch.

vid-, L. *video,* see. ev'idence (L. *evidens,* clear, = *e,* out, + *video,* see).

vid-, L. *viduo,* part, deprive of. divis'ion; individ'ual; not parted.

vigor, L. *vigor,* strength (<*vigeo,* be brisk). invig'orate; vig'orous.

vine, L. *vinea,* vinyard (<*vinum,* wine). vine; vine'tum; vin'yard.

vill-, L. *villus,* shaggy hair. vil'li (pl.); vil'lous (L. *villōsus,* rough haired).

Viola, L. *vĭŏla,* violet.

viper, L. *vīpĕra,* viper, either a contraction of *vivus,* alive, + *pario,* bear, or from *vibro,* quiver.

vir-, L. *vĭrĕo,* be green; *vĭrĭdis,* green. vir′eo, green bird, greenlet; vires′cent; virides′cent.

virg-, L. *virga,* twig, wand. vir′gate.

virus, L. *vīrus,* noxious slime, poison. vir′ulence; vi′rus.

vis-, L. *vĭdĕo (vīsum),* see. provis′ion; vis′ible; vis′ion; vis′-ual.

visc-, L. *viscum,* glue. viscos′ity.

viscera, L. *viscĕra,* entrails (sing. *viscus,* inside of body). evis′cerate; vis′ceral.

vita, L. *vīta,* life. vi′tal; vi′talism; vi′tamine (life + amine).

vitellus, L. *vitellus,* egg-yolk. vitel′line; vitel′lophag, yolk eater.

vitr-, L. *vitrum,* glass. vit′reous, glassy.

viv-, L. *vīvus,* alive. vi′able; viva′rium; vīvip′arous; vivisec′tion, living cut.

vocal, L. *vōcālis,* uttering sounds (<L. *vox* [*voc-*], voice).

vol-, L. *vŏlo,* fly. vo′lant, flying; vol′atile (L. *volātilis,* winged).

volv-, L. *volvo (volūtum),* turn around. convolu′tion; evolu′-tion, out rolling; invol′ucel; in′volucre (L. *involūcrum,* wrapper); involu′tion, in folding; Vol′vox, roller.

vomer, L. *vōmer,* plowshare. vo′merine.

vor-, L. *vŏro,* devour. Carniv′ora, flesh eaters; herbiv′orous, plant eating; Insectiv′ora, insect eaters; vora′cious.

vulture, L. *vultur,* vulture (L. *vello* [*vulsus*], tear).

W

walrus, See whale.

wapiti, N. Am. Ind. *wapiti,* white rumped.

wasp, AS. *wæsp,* wasp (<L. *vespa*). ves′piform, wasp shaped.

water, AS. *wæter,* water.

wattle, AS. *watel,* hurdle.

wax, AS. *weax,* wax. beeswax; waxwing.

weasel, AS. *wesle.*

weed, AS. *weōd,* weed. milkweed.

weevil, AS. *wifel,* beetle. boll weevil (AS. *bolla,* seed-pod. bowl).
whale, AS. *hwæl;* Germ. *Walfisch.* narwhal (<Icel. *nas,* nose); walrus (Sw. *hvalross,* whale horse, see p. 30).
wheat, AS. *hwæte.*
whorl, ME. *whorwhil,* spinning wheel. whorl.
willow, AS. *welig.*
wing, Icel. *vængr,* wing. winged.
wolf, AS. *wulf* (<L. *vulpes,* fox, not from L. *lupus,* wolf).
wood, AS. *wudu,* wood, tree. woodbīne, tree bind.
woodchuck, Am. Ind. *wejack.*
worm, AS. *wyrm,* worm, originally including also snakes (<L. *vermis*). flatworm; wormwood (see p. 26).
wort, AS. *wyrt, wort,* a plant. liverwort.
wren, AS. *wrenna.*
wrist, AS. *wrist,* wrist (<AS. *wrīthan,* twist).

X

X-, (1) indicating the principal unknown quantity; (2) shaped like the letter X. (1) X-chromosome; X-rays: (2) see *chiasma* and *decussate.*
xanth-, Gr. ξανθός, *xanthos,* yellow. xan′thein; xan′thophore.
xen-, Gr. ξένος, *xenos,* guest, stranger. metaxe′nia; xe′nia (Gr. ξενία, *xenia,* privileges of a guest); xenobio′sis, living as a guest; xenog′amy, cross fertilization.
xer-, Gr. ξηρός, *xēros,* dry. Phylloxe′ra, leaf drier; xe′ric, adapted to aridity; xeroph′ilous, desert loving; xe′rophyte, dryness plant.
xiph-, Gr. ξίφος, *xiphos,* sword. xiph′oid; xiphoster′num; Xiphosu′ra, sword-tail.
xyl-, Gr. ξύλον, *xylon,* wood. xy′lem, xy′lol, wood oil; xyloph′agous, wood eater.

Y

Y-, (1) associated with X- to indicate an unknown quantity; (2) having the shape of the letter Y. (1) Y-chromosome; (2) Y-cartilage.

yeast, <AS. *gist,* yeast.

yoke, <AS. *geoc,* link <L. *junct-,* joined.

yolk, <AS. *geolca, geolu,* yellow.

yucca, Span. *yucca,* bayonet plant. yucca-moth.

Z

Zea, Gr. ζέα, *zea,* a kind of spelt.

zo-, Gr. ζῶον, *zōon,* animal. azo'ic; spermatozo'a, seed animals; zo'oids; zō-ol'o-gy, animal science; zo'ome, animals collectively (Gr. ὁμοῦ, *homou,* jointly); zo'ospore.

zoe-, Gr. ζωή, *zōē,* life. zoe'a.

zona, Gr. ζώνη, *zōnē,* belt, girdle. interzo'nal; zona'tion; zone.

zyg-, Gr. ζυγόν, *zygon,* yoke. homozy'gous; zȳgomor'phic, or zȳgomor'phic, yoke shaped; zyg'ospore, joined together spore; zyg'ote, or zy'gote.

zym-, Gr. ζύμη, *zymē,* ferment. en'zȳme; zy'mogen; zymot'ic.